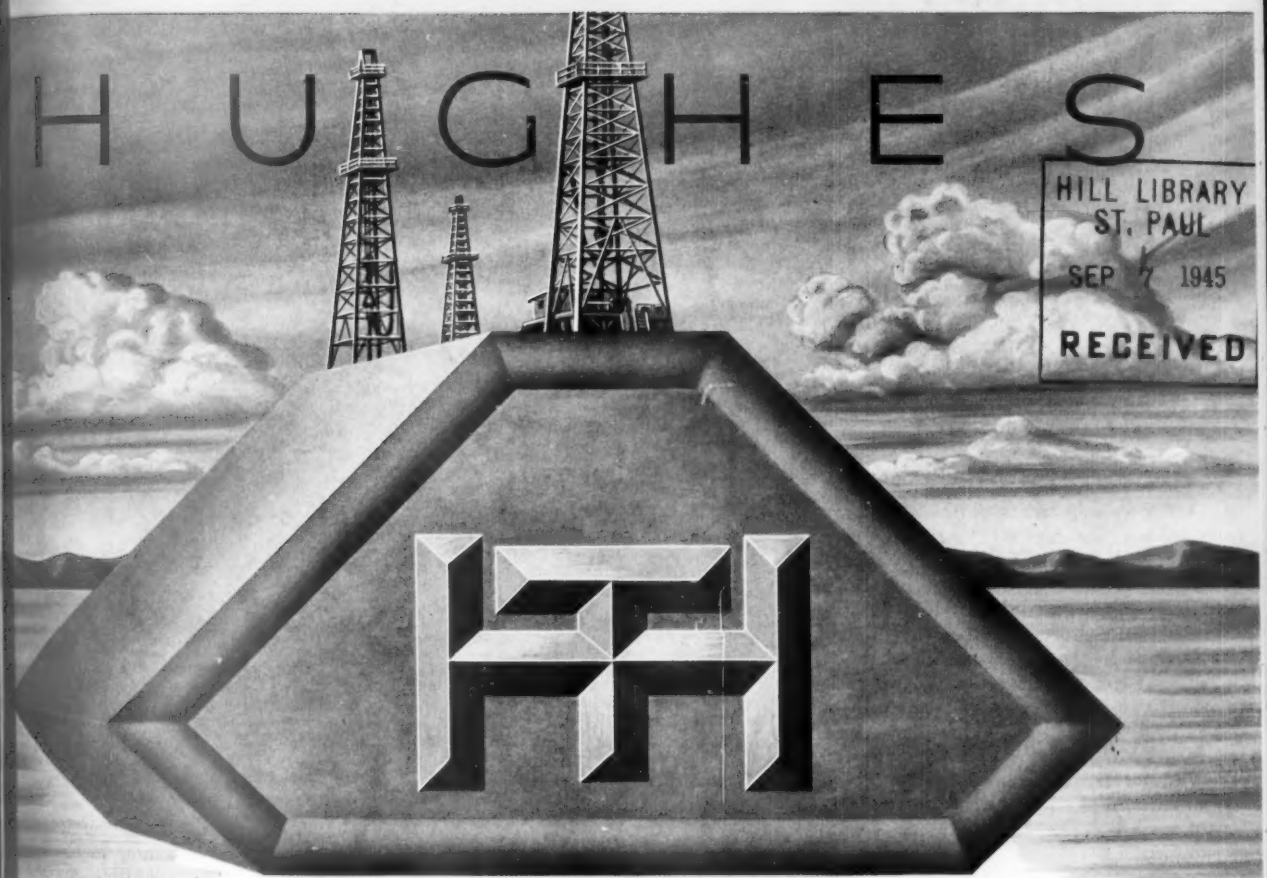
# The OIL AND GAS JOURNAL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SEPTEMBER 8, 1945


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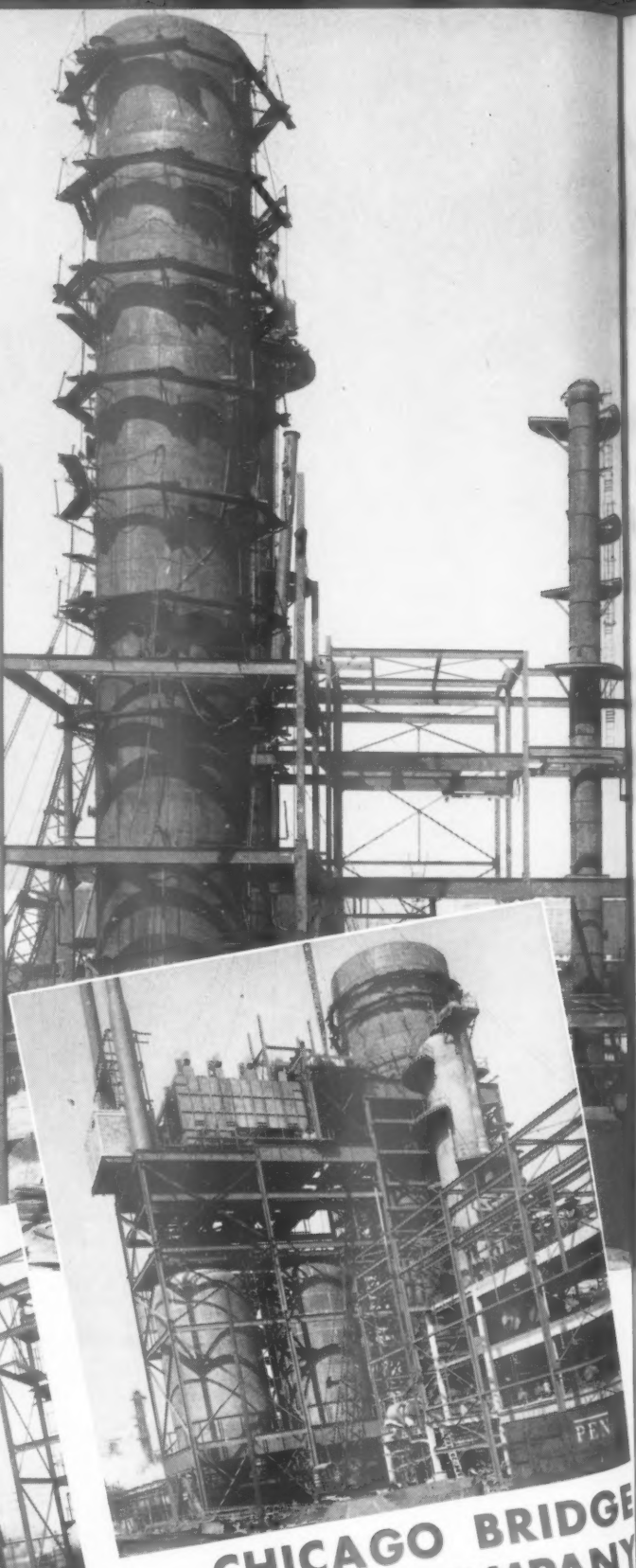

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# the OIL AND GAS JOURNAL

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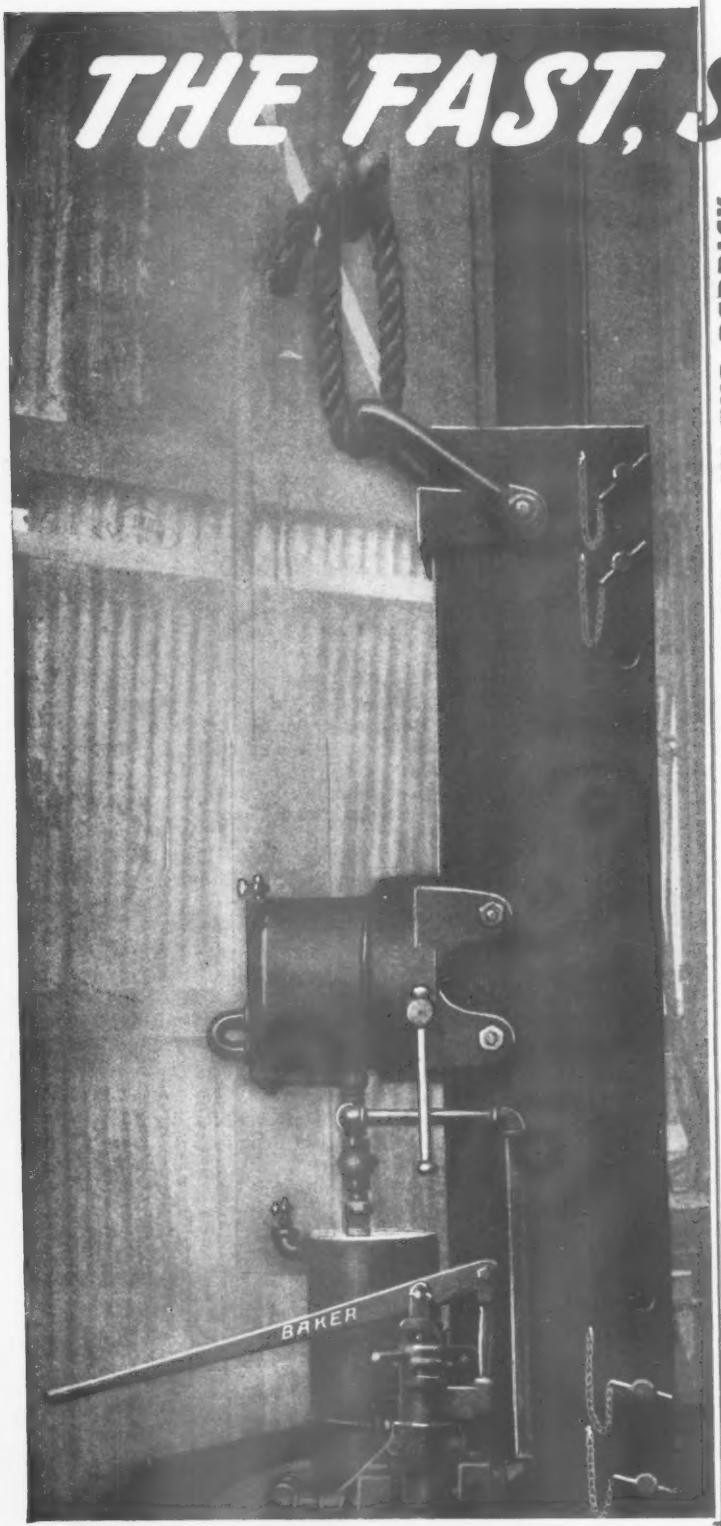
# THE FAST, SAFE WAY




IT'S EASY TO STRAIGHTEN DRILL PIPE

DRILL COLLARS AND KELLY WHEN THEY HANG VERTICAL IN THE DERRICK

## TO STRAIGHTEN BENT KELLYS AND ALL TYPES OF PIPE, IS... WHILE THEY ARE SUSPENDED IN THE DERRICK

## using a BAKER PORTABLE HYDRAULIC KELLY STRAIGHTENER

THIS highly efficient and easily operated device utilizes the principle of the hydraulic ram, applying the force built up by a manually operated pump to the bend in the Kelly, drill collar or drill pipe AS IT HANGS SUSPENDED IN THE DERRICK.

Probably more Kellys are bent during transportation, and in being laid down and picked up, than any other cause. Frequently a Kelly that has just been straightened in a shop will again be bent during the process of transporting it back to the well, rolling it off the truck, and dragging it into the rig.

### EASY TO STRAIGHTEN IN THE DERRICK

When the Baker Kelly Straightener is used, the job is done RIGHT ON THE ROTARY TABLE with the Kelly hanging in its normal position. The hazards, the loss of time, and the expense of transporting and handling are entirely eliminated. In foreign or isolated fields the Baker Kelly Straightener is considered indispensable as the cost and loss of time in transporting a bent Kelly or drill pipe to and from a distant shop are serious matters.

An important feature of the Baker Hydraulic Kelly and Pipe Straightener is the fact that it is completely portable, the entire unit weighing only 1,200 pounds. It can be transported readily on a small pick up truck, or a trailer, and by means of the cat line is quickly set up on the rotary ready for successful operation by following simple instructions.

Pressure sufficient to straighten 8¼" diameter Kellys or pipe can be built up without undue exertion, by manual operation of the hydraulic pump. It is safe to use, and the only parts subjected to wear are inexpensive and readily replaceable—the body and pump will last indefinitely.

Ask for details and prices on this efficient device which quickly pays for itself and then pays dividends for a long time.

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Houston — Los Angeles — New York

**BAKER**
PORTABLE HYDRAULIC STRAIGHTENER

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# Trends

Crude-Oil Production
By States—Page 130

**CRUDE-OIL STOCKS** 211,813,000 bbl. as of August 25—down 97,000 bbl. One year ago 222,931,000 bbl.

**GASOLINE STOCKS** 83,693,000 bbl. as of August 25—down 2,292,000 bbl. One year ago 79,169,000 bbl.

**RESIDUAL FUEL-OIL STOCKS** 46,201,000 bbl. as of August 25—up 1,356,000 bbl. One year ago 59,396,000 bbl.

**GAS OIL AND DISTILLATE STOCKS** 39,782,000 bbl. as of August 25—up 1,107,000 bbl. One year ago 40,538,000 bbl.

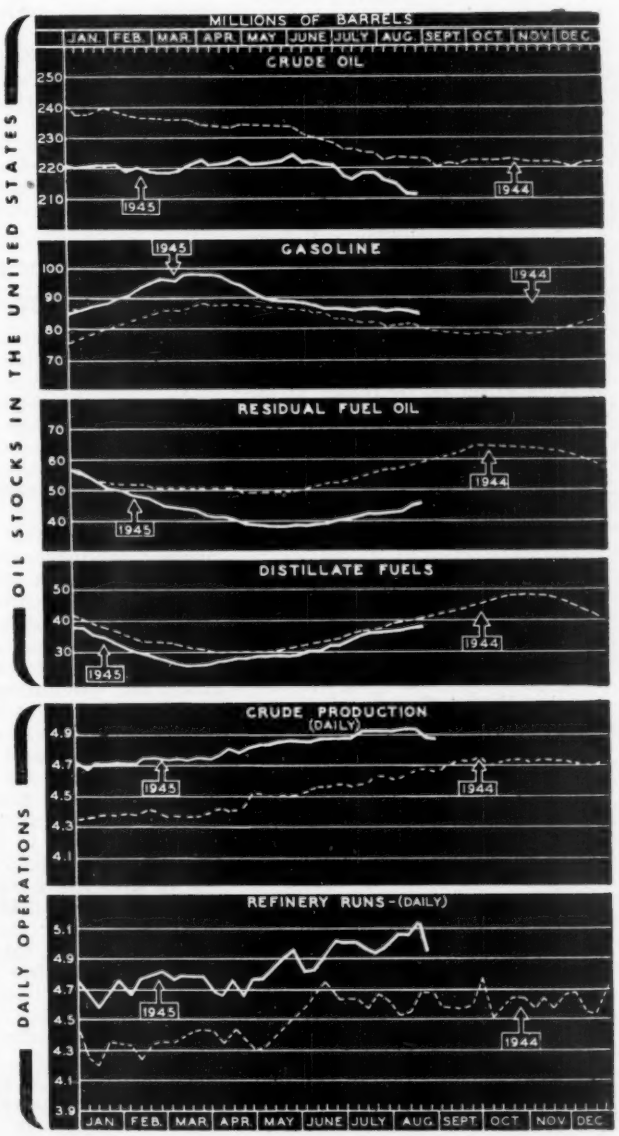
**CRUDE-OIL PRODUCTION** 4,872,050 bbl. as of September 1—down 16,750 bbl. One year ago 4,648,800 bbl.

**REFINERY RUNS** 4,931,000 bbl. daily week ended August 25—down 209,000 bbl. One year ago 4,690,000 bbl.

DISCLOSURE last week of export and import petroleum commerce for the first time since September 1941 furnishes some highly significant data. Receipts of foreign oil and offshore shipments were generally higher than had been assumed by most observers. Exports reached a peak of approximately 620,000 bbl. daily during the first 6 months of 1945 compared with an average of 255,000 bbl. per day in the same period for 1941. The increase in tankers and the rising tempo of the war are clearly charted by gains in petroleum exports, forming a parallel which confirms the importance of oil in military operations. For example, petroleum exports averaged 532,000 bbl. daily in the first half of 1944. For the entire year of 1944, petroleum exports averaged 571,000 bbl. daily.

THE rise of imports followed somewhat similar lines, reflecting elimination of submarine sinkings, increasing availability of tankers and the general gain in Latin American producing operations. Crude oil and refinery product receipts by this country averaged 239,000 bbl. daily in the first 6 months of 1941. In the first half of 1944, imports averaged 256,000 bbl. daily and in the comparable period this year receipts increased to 298,000 bbl. per day. Conditions indicate that current imports of about 300,000 bbl. per day will be sustained indefinitely and probably will increase as Middle East facilities are placed in position to supply a larger share of the European market.

REPORTS on foreign petroleum trade show further that a substantial portion of the immediate postwar cutback of oil operations will hit hardest at the exporting companies. This indicates that pressure of contraction will apply least against strictly domestic operators although competitive forces within the country will be intensified. Within a comparatively short period, most of the war-inspired increase in petroleum exports probably will disappear. The difference of 365,000 bbl. daily between prewar exports and the wartime peak will go far in softening the impact of conversion on independent and domestic company producing operations, provided costs are competitive with major integrated units which have been the chief suppliers of offshore shipments.



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# Petroleum Industry Employment Level Will Remain Unchanged

WASHINGTON.—Cutbacks in military contracts for petroleum products as a result of the victory over Japan are not expected to cause any measurable unemployment in the petroleum industry, Deputy Petroleum Administrator Ralph K. Davies announced today.

Cancellation of contracts for war products in specialized plants, such as those erected for the 100-octane aviation gasoline program, will cause some localized layoffs, but the industry as a whole, after reabsorbing all its returning war veterans, will still need additional personnel, Davies explained.

During the war, the petroleum industry in the United States increased its total production approximately 25 per cent, from slightly more than 4,000,000 bbl. a day in 1941 to more than 5,000,000 bbl. a day for the current quarter of this year, Davies said.

It is expected that the increased requirements for civilian petroleum products such as gasoline and home heating oil will to a considerable extent compensate for the decrease in military demands caused by cessation of hostilities. The remaining net decrease in demand will be in large measure offset by decreases in undesirable supply operation. These supply reductions include elimination of production of crude oil at higher than efficient rates and the discontinuance of subsidized operations, including curtailing of operations in the Elk Hills Naval Reserve, stopping movement of West Texas crude to California and similar wartime expedients.

Davies stressed that a small decrease in the total throughput of crude oil in the refineries throughout the United States would not mean any considerable decrease in employment. Some oil fields are operating above the maximum efficient rate in the war program and will merely return to peacetime levels, not entailing any measurable change in employment, he pointed out.

Some marginal plants, many of which were idle before the war and some operated for the Reconstruction Finance Corp., may shut down altogether for one reason or another, the deputy administrator said.

Most of the additional facilities that made possible the 25 per cent increase in operations were in the form of additions to already existing plants and will be retained for the most part in postwar company programs, he said.

For example, approximately $835,000,000 was expended on facilities in the United States for the 100-octane gasoline program since Pearl Harbor, but more than $600,000,000, or nearly 75 per cent, was spent by private industry on facilities expected to be of permanent value.

Of the remaining facilities, costing less than $235,000,000, it is expected that some will be continued in operation on rental or outright purchase agreements now being negotiated by the owning agency, the RFC.

"Hundreds of thousands of dollars' worth of maintenance work, cut to the minimum during the war because of lack of manpower, will have to be undertaken to bring plants to prewar efficiency. Marketing and distribution staffs will have to be rebuilt," Davies explained.

## Jersey Company Raising Employe-Wage Base

NEW YORK.—Representatives of management and labor of Standard Oil Co. (New Jersey) operating affiliates last week started discussions on a schedule of wage adjustment up to 15 per cent to apply to a 40-hour peacetime work week, it was announced by Eugene Holman, president.

Holman said the proposal was planned to cushion transition from the overtime work schedules of war to the normal schedule of peace, and to take up some of the slack in "take-home" pay resulting from the ending of extended working hours for war production. He described the move as in accord with the renewed right of employers and employes to bargain on wage increases so long as the result did not increase prices of products.

The changes proposed would be made according to the following formula, Holman said:

1. In units where the present work week is 48 hours, it is to be reduced to 44 hours on or about September 1 and basic wage rates increased 5 per cent, with time and one-half for the 4 hours above 40.

2. The work week would be further cut to not over 40 hours not later than January 1, with an additional increase of 10 per cent of the present basic wage rate.

"Full employment and maintenance of purchasing power are of particular importance at this moment," Holman pointed out. "The cutback in weekly working hours and the 15 per cent wage increase are designed to help meet these objectives.

"To cut back to 40 hours a week without making some adjustment would mean, to large groups of our employes, a reduction of 23.2 per cent in their weekly take-home pay. The upward adjustment will mean that the reduction in take-home pay will be less than 9 per cent. And workers will have that long awaited additional day a week off."

The increase will apply not only to plant workers but also to office workers except for executives. Acceptance by all the personnel involved would affect approximately 36,000 persons.

## Socony-Vacuum Grants 10 Per Cent Wage Raise

NEW YORK.—A salary increase of 10 per cent for approximately 21,000 employes in the nonexecutive classification was announced last week by the Socony-Vacuum Oil Co., Inc. The raise is effective September 1, at which time, or as soon thereafter as practical, each operation of the company on an extended work week will revert to its normal 40-hour period.

The increase affects employes in all domestic operations of the company such as producing, manufacturing, research and marketing.

Employes who have been on leave with the armed services and who return to the company's active payroll will receive the increase in pay.

## Fitz-Hugh Heads Carter's New Economics Division

An economics department, headed by J. R. Fitz-Hugh, Tulsa, for the past year coordinator of refining and manufacturing operations, has been established by The Carter Oil Co. Fitz-Hugh joined Standard Oil Co. of Louisiana as process engineer at the Baton Rouge refinery in 1937. He served there in the refinery crude and marketing department from September 1939 until the spring of 1944, when he was named Carter's refining and manufacturing coordinator. Fitz-Hugh received his degree in chemistry from the University of Virginia in 1934 and his master's degree in chemical engineering practice from Massachusetts Institute of Technology in 1937.

# Oil-Industry Materials Are Regulated by WPB Rule

WASHINGTON. — General inventory rules continued by the War Production Board for the reconversion period were issued in a single regulation last week. With the revocation of PAW Order P-98c, the petroleum industry will be governed by these general controls, which are now embodied in WPB's Priority Regulation 32.

The new regulation incorporates the inventory rules formerly contained in Priorities Regulation 1 and the Controlled Materials Plan Regulation 2, and lists the remaining orders of WPB containing inventory restrictions on particular materials or classes of persons. PR 32 also designates the divisions administering specific controls.

Restrictions on industry's ordering more than needed, which formerly applied generally only to rated orders, now apply on all ordering except for materials in ample supply. A list of these, exempted from controls, includes aluminum, cork istle fiber and products, jute fiber and products (except burlap), sand, gravel, crushed stone, slag, pipe fittings (steel and brass) and steel and iron valves. Additional commodities in ample supply will be added to the exemptions from time to time.

The petroleum industry will benefit from the remaining assistance mechanisms held by WPB. Production directives can be issued if necessary to protect the needs of highly essential industries, although WPB expects to have little need for them.

In addition, WPB's new "CC" rating, devised as a means of breaking bottlenecks, will be available to petroleum operators who find themselves unable to go ahead without help in obtaining some key piece of machinery or equipment. Termed a "nonextendable" rating, this CC priority will be granted only in cases of real need, and will not provide for continued aid to any firm.

WPB regional offices have been instructed to issue these priority tickets sparingly, to make sure that they are not used to give one competitor an advantage over another, and to be somewhat more generous in extending this aid to small firms than to large companies.

# State Rights Emphasized by Oil Compact Commission

OKLAHOMA CITY. — Regulation of the natural-gas industry is an "exclusive function of the sovereign states," in the opinion of the Interstate Oil Compact Commission's executive committee, which held a 3-day conference here August 30-September 1 to formulate the commission's position in the Federal Power Commission's investigation opening September 17 in Kansas City.

Gov. Andrew F. Schoeppel, of Kansas, chairman of the compact commission, will be its spokesman in the FPC investigation. Referring to a "state's rights" resolution adopted by the interstate organization following a survey last June, Governor Schoeppel said: "That is our policy, and that is what we shall stress before the FPC. Spokesmen for the power commission have said it does not want to encroach upon the rights or powers of the state. The compact commission's resolution speaks for itself. It was adopted after long study and discussion."

The commission's resolution recommended that the producing states adopt an "aggressive policy looking toward the enactment and enforcement of legislation to bring about a proper development of natural gas resources and a rigid enforcement of sound conservation practices, which policy is the best insurance against intervention on the part of the federal Government."

Neither prices nor costs of natural gas will be discussed by the interstate commission's representative, said the governor, who added that these subjects were outside the scope of his organization. Nor will it touch on the end use of natural gas, although, the governor asserted, the industry feels that FPC has gone beyond its proper functions in determining the uses to which gas may be put. The interstate commission will suggest measures through which federal agencies may be of service to the producing states, particularly in the matter of transporting commodities produced in violation of state laws.

The interstate commission will contend at the FPC investigation that the states, individually and collectively, have enacted legislation, rules, and regulations for proper development of fields, prevention of waste, and conservation of products.

## Ohio Oil Promotes Two Top Executives

FINDLAY.—Changes in the management ranks of The Ohio Oil Co. were announced this week by President O. D. Donnell.

Effective September 1, C. L. Fleming retires as a director, vice president and manager of the refining and marketing department under the company's retirement plan, after having completed 47 years of continuous service.

Wilson B. Emery, now vice president and manager of production, has been elected a member of the board to fill the vacancy caused by Fleming's retirement. C. Z. Hardwick, who has been assistant manager of the refining and marketing department since 1934, has been elected a vice president and will succeed Fleming as manager of the department.

Fleming's retirement terminates a unique career that began as an office boy in the company's Oil City office on June 10, 1898. Transferred to Findlay 2 years later as a stenographer in the executive offices, he served in various secretarial capacities until January 1, 1915, when he was made assistant secretary of the company. He was elected secretary in May, 1918, and on February 7, 1927, was elected to the board. The following year he became a vice president. From 1927 until the early part of 1934, Fleming was in charge of crude-oil sales. In the latter year he was placed in direct charge of the company's refining and marketing operations.

## Judd Resigns Post in Fuel-Price Division

WASHINGTON.—Orville D. Judd, associate director of the Office of Price Administration fuel division, resigned his post last week to enter a wholesale grocery concern, Pantree, Inc., in Richmond, Va. He was succeeded by Harold Reppert, coal price executive in the same division.

Widely known in the oil industry, Judd went to OPA in April, 1942, as price executive for the petroleum branch in the Cleveland regional office. In August, 1944, he became associate director of the fuel division.



XUM

# Price Ceilings and Stripper Subsidy Payments Uncertain

WASHINGTON.—The fate of crude oil price ceilings and stripper-well subsidy payments are still under consideration within the Office of Price Administration and other concerned agencies, Orville Judd, retiring fuel director, said last week.

Decision on the question of ceilings lies between suspending ceilings on a 90-day basis, as is contemplated in other commodities, or withdrawing them entirely. OPA will decide within a few weeks when such now-unknown factors as the size of the military need and the effect of state conservation regulations become clear.

Commenting on current talk in oil circles of a potential market glut of petroleum products, resulting from release of military holdings combined with cutbacks freeing vastly expanded facilities, Judd said he hoped the industry would retain stable prices. Nervousness over temporary excesses, he said, might lead to dumping of products and resultant price depression. The Navy is known to have vast stores of diesel oil, and the Army holds some 10 months' supply—40 million gallons—of gasoline in the Midwest, which had been earmarked for China operations. This is far in excess of amounts the military is expected to need. An orderly sale of excess holdings, Judd said, should keep prices relatively stable.

Price control, Judd said, has held Gulf Coast crude prices at levels slightly higher than normal due to the transportation subsidy system. Price control has also, Judd believes, ironed out some abnormal price structures in the Middle West.

Expressing the hope that a method of handling the stripper-well subsidies can be worked out to ease the repercussion of sudden ending of the program on some 16,000 operators, Judd indicated that this is largely a legal question.

If an officially proclaimed V-J day marks the legal ending of the war, Defense Supplies Corp. might lack authority to continue payments beyond that date, since the subsidy funds are appropriated for prosecution of the war. If this interpretation becomes official, it is likely that subsidies will be terminated prior to the lifting of ceiling prices.

In any event, Judd pointed out, complete withdrawal of ceiling prices would automatically end the stripper-well subsidy plan.

# Writeoff Recommended on $43,000,000,000 Lend-Lease Aid

WASHINGTON.—Some 43 billion dollars worth of lend-lease aid should, in the main, be written off, President Truman told Congress in the twentieth lend-lease report covering operations through June 30, 1945. Of this total, 5.2 per cent, or $2,184,730,000, represents the petroleum products delivered under the program.

Against this, the United States, up to last March 30, had received about 5.6 billion dollars worth of goods in reverse lend-lease. This, plus the fact that the war is won and commitment from all lend-lease nations to join in organizing post-war international trade on the basis of lowered barriers, the President indicated, represents a greater advantage to the United States than the dollar value of lend-lease.

If a debt of these proportions were added to the financial troubles of the Allies, the effect upon U. S. trade would be serious, the President pointed out.

Breakdowns of lend-lease aid and reverse lend-lease in petroleum products follow:

Reverse lend-lease to April 1, 1945, of petroleum and coal products: $1,209,379,000.

Lend-lease exports to the United Kingdom, cumulative to July 1, 1945, amounted to $1,479,045,000. During the first quarter of this year, $172,352,000 worth went to the U. K.; during the second quarter, $186,488,000 worth. Total reverse lend-lease from the U. K. to April 1 amounted to $910,365,000.

Total petroleum products lend-leased to the U. S. S. R. amounted to $103,975,000, of which $13,237,000 was sent in the first quarter of 1945, and $19,098,000 in the second quarter.

In addition, $43,000,000 worth of petroleum-refining equipment helped the Soviet Union expand its war production program.

Petroleum products lend-leased to China amounted to $1,787,000, of which $11,000 was shipped in the first quarter of 1945, and $146,000 in the second quarter. In addition, considerable quantities of various goods and commodities have been consigned to commanding generals of the U. S. Army for use in China under lend-lease.

A total of $149,292,000 worth of petroleum products went to India, the 1945 shipments amounting to $38,795,000 in the first quarter, $32,644,000 in the second. Reverse lend-lease from India included $248,435,000 worth of petroleum and coal products.

Australian shipments included petroleum products, trucks, synthetic rubber for tires. A total of $134,054,000 worth of petroleum products went to Australia, $4,861,000 of it in the first quarter of 1945, $6,344,000 worth in the second quarter. To New Zealand went a total of $15,601,000 worth, $546,000 during the first quarter of this year, and $1,598,000 worth in the second quarter. Through reverse lend-lease, the U. S. obtained $3,289,000 worth of petroleum products from New Zealand.

Small quantities of petroleum have been lend-leased to Continental European nations. Some $16,000 worth to France, none to Belgium or Luxembourg.

The Netherlands, through its colonies, has supplied some oil through reverse lend-lease, chiefly petroleum from Tarakan.

## District 2 Offices to Close Doors September 29

CHICAGO.—Employes of District 2, Petroleum Administration for War, with headquarters in Chicago, have been notified that their services will end September 29. This allows the 55 workers opportunity to seek other jobs. Some stenographers have taken positions offered by oil companies. A few key men, loaned by their regular employers, are expected to return to their former posts. Others have no definite plans.

District 2 began functioning in July 1941 with Wirt Franklin of Oklahoma as director-in-charge. In July 1943 Franklin was succeeded by W. W. Vandeveer of Cleveland. The present director-in-charge, E. J. Bullock, of Chicago, succeeded Vandeveer in December 1944.

At its peak, in July 1943, the organization had 146 employes. But as rapidly as major problems were cleared away, making possible any reduction in personnel, prompt action was taken, so that even before V-E Day, the organization was functioning smoothly with a force of 70 people.

# THIS WEEK

**EXPECTATION**—Completion of 50-bbl. wildcat near historic "Golden Lane" arouses Mexico's drowsing oil industry. . . . First wildcat producer since expropriation. . . . Now discussing advisability of letting United States operators return. . . . ¶Optimism manifested over oil prospects in France. . . . Recent discoveries encourage hope the country's serious fuel situation will be alleviated. . . . Geologists say rich pools may be found between Rhone and Atlantic Ocean. . . . ¶California's first important discovery of many months completed flowing 500 bbl. daily. . . .

**TECHNOLOGY**—Russian scientists getting aviation-gaoline component from turpentine. . . . "Twice as efficient as isooctane." . . . Also using turpentine as fuel for trucks, tractors, etc. . . . ¶General Motors develop 200-hp. engine for private planes. . . . Only 35 in. in diameter. . . . Probably only small engine having liquid cooling. . . . Supercharging blower increases performance and power reserve for takeoff and altitude. . . . ¶Government sees important future for helium. . . . Will keep huge reserves for defense purposes, but believes private industry will absorb surplus. . . . Some civilian uses found and search made for others. . . .

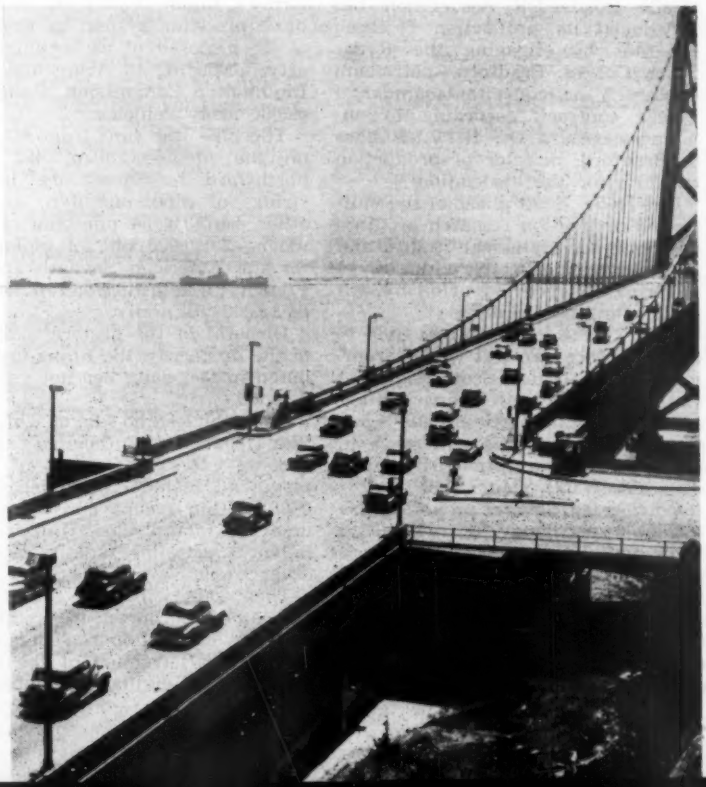
**PRODUCTION**—Decline in nation's crude output slowing up. . . . Daily average 4,872,050 bbl., drop of 16,750. . . . California slumps 30,750 bbl. to 884,750. . . . Kansas and eastern area up. . . . ¶Total completions for week, 476, decline of 33. . . . ¶Texas slashes daily allowable production for September 395,588 bbl. for total of 1,973,-813. . . . Represents cut of 16.7 per cent. . . . First step toward restoration of state's oil industry to peacetime levels. . . . ¶First full week following Japanese surrender reveals decreasing drafts on crude stocks. . . . Texas adds 104,000 bbl. daily to storage. . . . Not excessive, in view of exceedingly low stocks. . . .

**WORRY**—East Texas overproduced field to contribute almost 500,000,000 bbl. of crude to war effort. . . . Operators concerned over effect. . . . Bottom-hole pressure fell 26.49 psi. between Pearl Harbor and Jap debacle. . . . Number of wells declined 1,555. . . . ¶President Keck, Superior Oil, vigorously denies Ickes' assertion that "Keck and his gang prevented well-spacing legislation in California." . . . "Had nothing to do with it." . . . ¶Some shutdowns, but no serious oil-country damage, caused by Gulf hurricane. . . . ¶Interstate Oil Compact Commission will defend its policy of "state's rights" during forthcoming investigation of natural-gas industry by FPC. . . . Declares regulation is "exclusive function of sovereign states." . . .

**PIPE LINES**—Oil-industry committee will tell Congress Big-Inch and Little Big-Inch should be withdrawn absolutely from use as oil carriers. . . . Neither sell nor lease to private interests. . . . Would disrupt private peacetime economy. . . . No objection to conversion to natural gas. . . . ¶American Army's 487-mile Rhone Valley oil and gasoline pipe line in France declared "surplus." . . . To be sold. . . . ¶RFC reduces Big-Inch and Little Big-Inch tariff to equivalent of tanker rates. . . . Permits East Coast to get oil at what would be paid if moved from Gulf Coast by boat. . . .

**EMPLOYMENT**—Military cutbacks likely to cause only minor unemployment trouble, PAW says. . . . Probably confined to local layoffs. . . . Jobs predicted in all divisions of oil industry, with conspicuous expansion in marketing branch. . . . ¶Possible federalization of state unemployment programs eyed with distrust. . . . "Put premium on idleness." . . . ¶New Jersey Standard executives and employes plan wage adjustments for 40-hour week. . . . Others taking similar action. . . . Trying to disturb take-home pay little as possible without raising price of products. . . . ¶Senate committee foregoes vacation to struggle with Full Employment bill. . . . Examines parade of government witnesses, most of them favoring bill. . . . Byrnes approves principle. . . . Says America can lead the way. . . .

Acm



*A scene unfamiliar since late 1941 is this view of Sunday drivers on the San Francisco Bay bridge on the first week end following the Japanese surrender. As gasoline rationing made its exit, pleasure-bent passenger cars, filled to capacity, took to the highways all over the nation*



XUM

# International Oil Cooperative Proposal Gaining Momentum

NEW YORK.—Establishment of an international petroleum cooperative serving members in 41 countries will be proposed in London this month by Howard A. Cowden, president and general manager of the Consumers Cooperative Association with headquarters in Kansas City. Cowden is en route to the London conference of the International Cooperative Alliance.

Explaining that the shipment of some petroleum products to eight countries that have member cooperatives had been begun before the outbreak of the war and before the first refinery had been established in Phillipsburg, Kans., in 1939, Cowden revealed that 50 carloads of lubricants will be shipped to Sweden as soon as transportation is available.

"We propose through the International Cooperative Petroleum Association, comprising national cooperative wholesale organizations, to extend this membership on a democratic basis, with the privilege of one vote for each member, and to distribute the savings to the purchasing or consuming group."

He said this represented a new phase of international trade, which, if expanded, "would have a marked effect on the trade balances among the various nations."

One of the aims of the international petroleum organization, according to Cowden, will be to urge the United Nations Security Organization to set up "a world oil pool" which would function in fields outside of "the major oil-producing nations," in a manner similar to the state oil commission in Texas.

The purpose of this, he added, would be "to prorate the oil production" so that the demand and production might be established on an equitable basis, as proposed by the Atlantic Charter, rather than by separate treaties between governments. He cited as an instance the possibility of developing the oil fields of the Middle East. Cowden said the total output of petroleum products by the Cooperative Refinery Association for 1944 amounted to sales of $197,000,000, which include savings of 10 per cent to the members.

## Penn Grade Expands Production Research

OIL CITY. — The Pennsylvania Grade Crude Oil Association has broadened its production research program by engaging the Ryder Scott Co. of Bradford, petroleum engineers, as consultants under a 1-year contract, according to announcement by Dr. R. V. Hughes of Bradford, director of production research for the association.

The Ryder Scott phase of the multisided production research program will embrace statistical studies and laboratory experiments with respect to secondary recovery of oil by water-flooding.

Penn Grade funds will be used to drill and core two test wells recommended by Ryder Scott engineers as the result of a preliminary study of operating properties made some time ago. These tests will serve to check calculations previously made of residual oil content of water-flooded areas. Several properties are available for study on which all wells have been cored and analyzed and complete input and production records have been maintained.

The association last fall launched a $300,000 secondary recovery production-research program to extend over a 3-year period.

## Army's French Pipe-Line System Now "Surplus"

WASHINGTON. — The American Army's Rhone Valley oil and gasoline pipe-line system in France is to be disposed of as surplus property, according to Army and Navy Liquidation Commission, along with 82,000 army vehicles.

The pipe line runs from Marseille on the Mediterranean, 487 miles northward to Sarrebourg in two strings of pipe, one 6-in. and the other 4-in. Its 64 pumping stations moved 3,000,000 bbl. of motor fuel for the American Seventh and the French First armies at an average of 15,000 bbl. daily.

Disposal of the eastern extension of the line across the Rhine to Sandhofen in Germany has not yet been decided.

The vehicles, the sale of which the War Department authorized "as they become excess" as result of redeployment, include 25,000 jeeps, 25,000 half-ton trucks and an assortment of motorcycles, trailers, ambulances, gasoline tank trucks and other trucks.

Their sale will help the French and other European transportation systems, even though representing only a small fraction of the needs of dislocated civilian economies.

## PAW Reduced to Cleanup Work

WASHINGTON. — The Petroleum Administration for War is folding up as rapidly as possible and is already reduced to the stage of cleaning up paper work and administering a few remaining orders, it was learned this week. Of numerous war agencies in the process of liquidation, PAW is proving one of the most expeditious in the matter of putting itself out of business.

Remaining orders include:

Supply and transportation division: Directive 59, which is on its way out, covering transportation and distribution on the east coast. Directive 63, affecting the operation and utilization of the Big Inch pipe line. Directive 73, its parallel for the Little Big Inch.

Refining division: Recommendation 42, covering the sale of rights in oil refining processes to the Russian government.

Foreign division: Directive 70, which coordinates American oil companies in foreign operations. Two confidential recommendations dealing with naval operations on the west coast also remain on the foreign division's books.

Production division: Directive 19, the plan for producing, developing and transporting petroleum and natural gas in District 5.

Administrative recommendations: Recommendation 7, covering procedure between PAW and the district committees. Recommendation 24, affecting the duties, function and procedure of the Petroleum Industry War Council. PIWC is generally expected to liquidate along with PAW. Recommendation 33, applying to Districts 1 and 3, concerns the sale, exchange and loan of petroleum among marketers and distributors and the distribution of available supplies to meet essential requirements.

## British American Acquires Union Oil of Canada

TORONTO, Ont. — The business and physical assets of The Union Oil Co. of Canada, wholly owned subsidiary of Union Oil Co. of California, have been purchased by The British American Oil Co., Ltd. In addition to its retail outlets and distribution of petroleum products in British Columbia and Alberta, Union Oil has marine bunkering and storage facilities in Vancouver Harbor.

As a result of this acquisition British American extends its marketing activities from coast to coast, and the added volume of business will make that company the leading independent Canadian marketer of petroleum products.

# Richmond Exploration Has Active Campaign Started in Venezuela

*by Marian C. Cody*

THE Richmond Exploration Co. (a subsidiary of the Standard Oil Co. of California) began operations in Venezuela on June 13, 1944, and since that date has been aggressively engaged in organization of its offices and personnel, acquisition of both exploration and exploitation concessions, surveying its concessions, and starting both exploratory geophysical work and actual drilling operations.

Within little more than a year the company has acquired 4,018 hectares of exploitation concessions, 1,152,000 hectares of exploration concessions, started its first wildcat, now drilling below 3,601 ft., put six concession survey parties to work, three geological parties in the field (two seismograph, one surface geology), and started construction work on three operating base projects.

The company's exploitation concessions are divided into five groups, all located in the District of Miranda, State of Falcon. Group 1, called La Montanita, consists of five concessions comprising 625 hectares, which were acquired by transfer from the Coro Petroleum Co., notice published November 21, 1944. Richmond is drilling its first test, 1 Montanita, on this concession, and is now making hole below 3,600 ft.

Group 2, called Miranda "C," includes eight concessions, comprising 2,510.27 hectares, also acquired from the Coro Petroleum Co. at the same time as La Montanita. Group 3, called the Peras, is made up of 11 concessions, totaling 56.45 hectares, titles to which were published November 25, 1944. Group 4, known as the Falgo, includes four concessions, totaling 92.96 hectares, and titles were published at the same time as those in Group 3. The La Montanita reserves and Sobrante make up Group 5, which includes four concessions totaling 733.20 hectares, titles to which were published August 25, 1944.

The exploration holdings totaling 1,152,000 hectares, are divided into two groups, known as the Zulia concessions and the Reco concessions. The Zulia group, numbered from 1 to 75, totals 717,000 hectares, located in the districts of Urdaneta and Perija, State of Zulia, and titles were published November 17, 1944, and May 7, 1945. Four concession-survey parties, two seismograph parties and one surface geology party are now working in this area.

The Reco concessions, numbered from 1 to 44, include 435,000 hectares in the District of Maturin, Stage of Monagas, and the Departments of Tucupita and Pedernales, Federal District of Delta Amacuro. Titles were published January 9, 1945. At the present time there are two concession-survey parties active in this area.

The construction projects are known as La Arriaga and San Jose. The La Arriaga located on Lake Maracaibo, is divided into two parts. On the lake shore a terminal pier, yard, warehouse and shop facilities are being constructed. Camp and office facilities and dwellings are being built about 2 kilometers west of the terminal.

The San Jose project is a base camp for geophysical and exploratory operations in the southwestern portion of the Zulia concessions. Work has started on this camp, which is situated near the village of San Jose in the District of Perija.

Offices are maintained in both Caracas and Maracaibo. At Caracas, the resident manager, C. T. Newcomb, is assisted by a staff consisting of L. W. Henry, technical adviser; A. A. Weymouth, chief geologist; C. R. Cabrera, land and legal; E. J. Nelson, chief engineer; R. G. Williams, chief accountant, and E. C. Doell, industrial relations. At Maracaibo, P. B. Reed is district manager, and Kidd Gordon, drilling superintendent.

## California Wildcat Opens Deep Pool

**LOS ANGELES.— Ohio Oil Co. completed its Gardena wildcat at about 10,350 ft. September 3, flowing about 500 bbl. of crude daily but only a very small amount of gas, not over 200,000 cu. ft. Oil is light gravity and odor indicates some sulfur.**

**Completion of this wildcat opens a new oil field at Gardena in Los Angeles basin adjacent to town lot and residential area. Indications point to strict regulation of drilling to prevent over development.**

## Lower Ceilings Apply to East Coast Products

WASHINGTON.—Lowered ceiling prices for petroleum products on the East Coast went into effect September 1, following removal of wartime revenue price increases granted to help defray the East Coast oil transportation subsidy.

Cuts range from 0.6 cent to 1.2 cents a gallon for gasoline, from 1 to 1½ cents a gallon for kerosene, distillate heating oils and diesel fuel, and from 15 to 30 cents a barrel for heavy industrial fuels. Reductions are already effective at tank-car, barge and tank-wagon levels, but will not apply to retail stations for 2 weeks.

Some wartime price increases are retained, however.

A 0.3 cent per gallon fuel-oil ceiling price remains until October 31. This was granted retail sellers in 1942.

Port revenue price increases for terminal operators at all Atlantic Seaboard ports on all products except light diesel oils are retained.

An increase of ⅛ cent in ceiling prices of regular grade gasoline for refiners and all other sellers except at tank-wagon and retail levels is retained. This is merely restoration of ceiling reduction made August 15, 1944, because of the reduced quality of regular gasoline. Gasoline qualifying for this restoration must be at least 72 octane.

At the same time, the Office of Price Administration lifted the minimum octane rating qualifying for the premium grade ceilings from 75 octane to 78 octane.

## OPA Grants Higher Crude Ceilings in 22 Pools

WASHINGTON.—Ceiling price increases, ranging from 2 to 35 cents a barrel, have been granted by Office of Price Administration in 22 pools, in 8 states. The increases, effective as of August 1, are granted under the stripper-well premium-payment plan. The 22 pools, with the amount of each increase in cents per barrel, follow:

Arkansas — Nick Springs (Travis Peak), 24. Illinois — Maunie South, 20. Kansas — Graber, 5; Russell North, 35; Wherry, 5. Michigan — Temple, 2. New Mexico—Benson, 4. Oklahoma—Dora, 10; Loco, 5; Macomb South, 35; Palacine, 20; Wellston North, 35. Texas — Hull-Silk-Sikes-Caddo, 25; Iatan North, 15; Loving, 25; Olson, 17; Smyer, 20; Vincent (4,000 to 5,500 ft., 5. Wyoming — Half - Moon, 35; Maverick Springs, 28; Pitchfork, 34; Shoshone, 35.



XUM

# Drastic Cut in Texas Production Sets New Postwar Basis

AUSTIN.—Establishing a new basis for postwar crude production, the Texas Railroad Commission last week cut its state allowable 395,588 bbl. daily. Under the commission's order the September daily allowable will be 1,973,813 bbl. The basic allowable as of August 26 was 2,369,401. The drastic cutback was achieved by changing the number of producing days permitted in each field.

For the state as a whole the new allowable represents a reduction of 16.7 per cent. It ranged downward from a slash of 27.25 per cent in District 2, Southwest Texas. In East Texas, which feeds the big-inch pipe line, the drop was 17.24 per cent. The commission's figures, all in terms of permitted output of crude oil only, do not take into account estimated underproduction or production of distillates and condensates.

Petroleum Administration for War had assigned a daily production of 1,978,000 bbl. of crude daily for Texas. What actually will be achieved by the commission's action will not be known until August and September production figures are available for comparison.

"According to instructions given by the commission, all fields now producing above the maximum-efficiency rate have been reduced to the maximum-efficiency rate first," said Olin Culberson, chairman of the commission, in a statement accompanying the order.

### East Texas Given 20 Days

"East Texas was given 20 producing days which brought the allowable down from 384,810 to 318,452 bbl. All fields in the state were then placed on a 20-producing-day basis with the exception of the Panhandle, which was exempt from shutdown days due to the fact that the last report showed that the field produced only 87,667 bbl. per day. Therefore, it was our opinion that if the field had been placed on shutdown days, some of the wells and leases which are able to make the allowables would have been penalized.

"All the asphalt-type crudes, such as Cayuga, Talco, Sulphur Bluff and Hawkins, were put in a class by themselves, and Sulphur Bluff, Talco and Cayuga are still exempt and Hawkins was fixed according to the nominations.

"Since September is a 30-day month, in order to place all fields on a 20-producing-day basis for September, the plus maximum-efficiency rate fields which were first reduced to the maximum-efficiency rate were then reduced further by 5 days to place them on a parity basis with the other fields in the state, and those fields which were on the exempt list in order to allow them to produce oil for the war effort and those exempt fields which were not on the exempt list due to water conditions and other physical conditions, were also taken off the exempt list and 5-day shutdowns placed on them."

### Commission Realistic

The commission tried to be realistic in facing the situation it found in Texas, Ernest O. Thompson, member of the commission, commented.

"During the war period we have increased Texas' oil production to an unprecedented high of 2,200,000 bbl. per day," said Thompson. "On the day of Pearl Harbor we were producing in Texas 1,400,000 bbl. of oil per day. Thus it can be seen that we have increased Texas oil output by 800,000 bbl. per day. Certainly, come peace, we could not expect the market to consume any more oil just now than we were using before Pearl Harbor.

"Military needs will drop sharply. The consumption of the Army is about 1½ gal. of gasoline per soldier per day. With 5,000,000 soldiers and 2,000,000 sailors released from duty, the armed forces will need correspondingly less gasoline per day. Then besides this, the armed forces have large stocks of petroleum products on hand. These of course will be drawn upon for their needs instead of buying new products.

"There are about 4,000,000 fewer automobiles in private use than there were on Pearl Harbor day. This means a reduced domestic demand of about 175,000 bbl. of oil per day from this source. It will be some time before these 4,000,000 automobiles can be built and replaced. Condition of tires will slow down the extended driving of the 21,000,000 automobiles in use in America today. All these considerations make us come to the conclusion that to fail to reduce our oil production now would be lacking in courage to face the facts as they appear to us on the ground."

# Synthetic-Rubber Facilities to Continue in Full Operation

WASHINGTON.—Full operation of the nation's synthetic-rubber manufacturing facilities, including units installed within or in connection with petroleum refineries was recommended here last week for the indefinite future. The Rubber Bureau of the War Production Board recommended that all federally-owned manufacturing facilities be kept in production as long as tire rationing remains and perhaps for some time thereafter.

Rationing of tires should remain only so long as the difference between supply and demand makes orderly distribution without rationing impossible, the rubber industry advisory committee was told by WPB officials and an Office of Price Administration spokesman. Truck tires probably will be removed from rationing before passenger car tires and new cars will be supplied with only four tires so long as tires still are needed for rolling wheels now on the road, the discussion indicated.

Consideration of the postwar supply of natural rubber was shelved until definite information is received from the liberated areas of the Far East. Until this information is available and until some knowledge is gained of what the additional supplies of natural rubber will cost, it is impossible to determine the amount of synthetic rubber that will be required by industry, the committee members agreed.

However, a program was outlined for improving the quality of certain products when increased supplies of natural rubber become available. One of the first major items in which more natural rubber will be used is truck tires, it was said.

The committee was given tentative tire and tube production schedules through 1946. They call for 66,000,000 passenger automobile and motorcycle tires in 1946, an all-time high. The previous peak output was 53,000,000 in 1941. In the last 3 months of this year 11,774,000 are scheduled. Of next year's total 44,000,000 will be available for civilian replacement and export.

FOUNDED IN 1910

BY PATRICK C. BOYLE

The OIL AND GAS JOURNAL

# Clear Thinking Required

CLEAR reasoning and fair dealing are needed as never before in the petroleum industry's labor relations now taking shape as one of the major conversion problems. Work stoppages, from whatever cause, are costly to employes and employers alike. Most disputes can be amicably resolved around the conference table. The industry has an excellent record. Its employes are among industrial workers with highest incomes. Companies have been particularly liberal in providing sick benefits and retirement funds.

There should be no departure from the general policy which has created unusual loyalty between management and employes. Difficult situations are developing, however, which call for even greater attention to the common problems.

Employers in the industry should accept this opportunity for leadership. They are entitled to maximum cooperation from employes. There should be redoubled determination by all interests to avoid costly interruptions of production. It is particularly important in this period of adjustment that nothing increase the cost of products.

Thus, and thus only, can employers fulfill their desire to increase base pay for those returning to the normal 40-hour week and at the same time reemploy war veterans.

There is still another obligation which the industry is anxious to dispatch with full credit. This concerns the organized objective of all industry to employ about 56 million, which means a substantial increase in business activity above the most productive prewar year. Industry must not fail. Many influential groups are already working on the assumption that it will falter. They are ready to turn the direction of the full-employment program over to government. Even now they argue that industry lacks the vision necessary to see the plan through.

The oil industry, naturally, has a highly important role to fill in the general employment program. Somewhat deficient prewar data show that the oil business engaged directly about 1,125,000. Nearly 60 per cent were employed in the marketing division. Assume for example that the oil business' share of the postwar employment plan is 3 per cent. This means that industry should provide gainful employment for around 1,500,000. The indicated increase of 40 per cent seems high, but is in line with performance expected from other industries enjoying expansion of demand comparable to that expected for petroleum.

The problem is particularly acute in the immediate future. For 12 months, perhaps longer, the industry faces a contraction of markets in contrast with the relatively steep increases during the past 3½ years. Shrinking demand with higher labor costs presents an exceedingly complex dilemma.

The only way by which the industry can meet the challenge is to lower unit costs. This requires the combined efforts of labor and management.

Several of the industry's largest companies have already assumed constructive leadership in this problem. They are to be congratulated, and their programs warrant thoughtful study by their contemporaries. They have provided a cushion for the conversion period in adjusting base pay upward by 10 to 15 per cent. Thus, the elimination of overtime for 4 to 8 hours per week will make minor difference in the take-home envelope.



XUM

# INTERNATIONAL

## Premier (Trinidad) Plans New Plant, Deeper Drilling

Installation of modern refinery equipment and extensive development of deeper oil pays in the San Francique, Trinidad, property and other leases to be acquired are planned by Premier (Trinidad) Oilfields. Program for realizing these objectives is now under consideration and calls for adjustment of capital "to eliminate from the balance sheet the intangible assets, debit at profit and loss account, and preliminary expenses and to bring up to date amortization of oil wells and depreciation of leases."

The program covers not only the provision of new plant to conform to modern technical practice, but also the drilling of wells to the deep sands believed to underlie the company's San Francique and other leases to be acquired. Recent exploration, the company reports, has revealed the existence of large reserves in the deep horizons locally known as the Herrera sands.

Conditional contracts have been negotiated for acquisition of other properties, some of which are adjacent to the company's current leaseholds in San Francique. The company attaches considerable importance to the acquisition of these additional properties as they will broaden the base of the company's operations and subsequently increase its potential oil reserves.

## Mexican Wildcat Producer Wakens Sleeping Industry

MEXICO CITY.—Completion by Petroleos Mexicanos (Pemex), government oil company, of 1 Soledad, a 50-bbl. wildcat, 25 miles west of the historic "Golden Lane," between Tampico and Vera Cruz, has aroused this country's somnolent oil industry. The 1 Soledad, first Mexican wildcat to hit pay since foreign oil companies were expropriated in 1938, was drilled to 6,480 ft. It is yielding 40-gravity crude from the same sand found in all neighboring fields of the Tampico area. Pemex says it opens a new pool.

A new gas field has been opened by 1 Mission, near Reynosa and 900 ft. from the Texas border. The well has an initial production of 6,000,000 cu. ft. of gas and 45 bbl. of distillate. At 6,040 ft., it is the deepest productive gasser in the world drilled with firewood as fuel. Drilling has begun on 2 Mission and 1 Las Norias has been rigged up.

A gas shortage in northern Mexico, necessitating importation from Texas, will be alleviated by more drilling in the 1 Mission structure, Pemex said.

United States interests figure actively in plans under discussion for building new refineries and enlarging existing plants and for new and expanded pipe lines.

Exploration is under way in six untested zones: Coahuila, Chihuahua and Nuevo Leon, in northern Mexico; Tamaulipas, between the San Carlos mountains and the Gulf coast; parts of Vera Cruz, Chiapas and the Yucatan peninsula, southwest Mexico; Oaxaca and Guerrero, southern Mexico; Nayarit and Sinaloa, west coast, and southern Lower California.

Since wildcatting is expensive and Pemex is operating at a loss, the possibility of Mexico permitting United States oil companies to return, forming subsidiaries in which Mexican capital predominates, has been discussed. United States producers, however, are finding outlets in Venezuela, Colombia, Brazil, and elsewhere, and informed persons consider their return unlikely unless Mexico offers adequate guarantees against expropriation.

## Preliminary Work Started On Venezuelan Refinery

In addition to its refinery at San Lorenzo on Lake Maracaibo, which is currently processing about 38,000 bbl. of oil daily, the Shell group has recently commenced preliminary work in connection with the erection of a new refinery in Venezuela. The site selected for this new refinery is near Punta Cardon in the southwest part of the Paraguana Peninsula on the northern coast of Venezuela. The plant will have a capacity in excess of 40,000 bbl. per day and will be known as the Cardon refinery, and its completion will result in doubling Shell's refining capacity in Venezuela.

The Shell group contracted in February 1943 with the Venezuelan Government to increase existing refining facilities within the country by 40,000 bbl. per day. This agreement called for the extension of plants already in operation or the establishment of new installations, and the Shell group has decided to meet this obligation by erecting this new refinery at Cardon. The original contract with the Government called for these extensions to be constructed within 5 years following the termination of the war or, should materials become available prior to the war's end, then within 5 years as of that date. The refinery will be owned and operated by The Shell Co. of Venezuela, Ltd., a new company which has recently been registered in Venezuela.

After considerable study of the entire western Venezuelan coast line it was decided to locate this refinery at Cardon due to its accessibility to Maracaibo Lake where the Shell group at present has the majority of its petroleum reserves, and also on account of its being located on deep water in a fairly sheltered position for navigation. Consideration was given to the laying of a pipe line from oil fields in the Maracaibo Lake, but due to the different types of crude produced on either side of the lake, it was decided that more flexibility would be obtained by using shallow-draught tankers for this purpose.

Operations were begun early this year to locate a source of fresh water on the Paraguana Peninsula. Three wells were drilled there without success and an intensive search is now being made on the mainland south of the Paraguana Peninsula between the Rio Mitare and Coro. Should insufficient water be found on the mainland to supply the refinery needs, Shell may possibly decide to import water by ocean tankers, augmented later on by large sea-water-evaporation plants.

It is estimated that the cost of this refinery will be in excess of 150,000,000 bolivars. It is intended to install the most modern facilities for the manufacture of a wide range of products, including aviation gasoline and lubricating oils. The refinery will have adequate terminal and loading facilities which will include the erection of wharves, etc. Plans have been prepared for building housing accommodation for the employes, hospital and medical facilities, sports ground and air field.

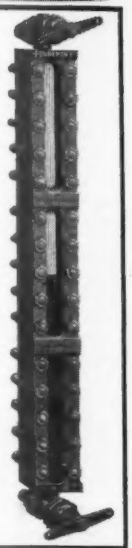
It is estimated that this new refinery will initially employ some 1,400 men with an increase later to about 2,000. Housing facilities are contemplated which will enable the company to accommodate the necessary employes and their families, so that a town of some 5,000 to 7,000 people, complete with schools, playing fields, hospital, shops, clubs and so on will shortly make its appearance. The training of staff for the new refinery is already receiving careful attention, emphasis being laid on using the highest possible percentage of Venezuelan staff.

Work has been started on the clearing of the site and initial construction, and a large number of men are already employed on this project. C. P. Louwerse, who has had considerable experience in refinery work with the Shell group, has charge of all construction work.

# PENBERTHY

"REFLEX"

DROP FORGED STEEL LIQUID LEVEL GAGES



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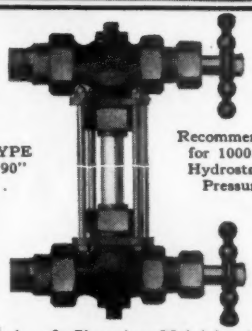
# PENBERTHY

DROP FORGED STEEL

LIQUID LEVEL GAGES



TYPE "90"

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Made of Chromium-Molybdenuin alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

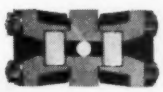
# PENBERTHY

"TRANSPARENT"

DROP FORGED STEEL LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.



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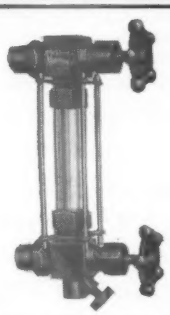
# PENBERTHY

"ALL IRON"

LIQUID LEVEL GAGES



Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

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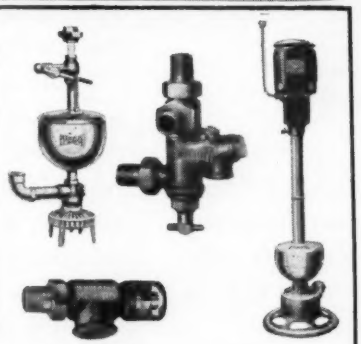

Penberthy injectors—ejectors—automatic electric and water (or steam) operated sump pumps are all widely used throughout the oil industry because they have always been dependable under the most severe service conditions.

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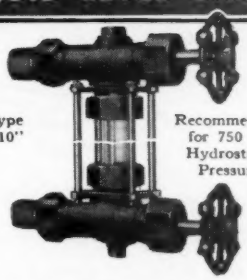
DROP FORGED STEEL

LIQUID LEVEL GAGES



Type "10"

Recommended for 750 lb. Hydrostatic Pressure

Steel construction throughout with stainless steel interior trim. Automatic shut-off is positive and instantaneous; stainless steel balls shut off the flow of liquid when glass breaks. Heavy duty stuffing boxes, union connections, offset construction facilitate cleaning and simplify glass replacement. Conform with A.P.I.—A.S.M.E. requirements.

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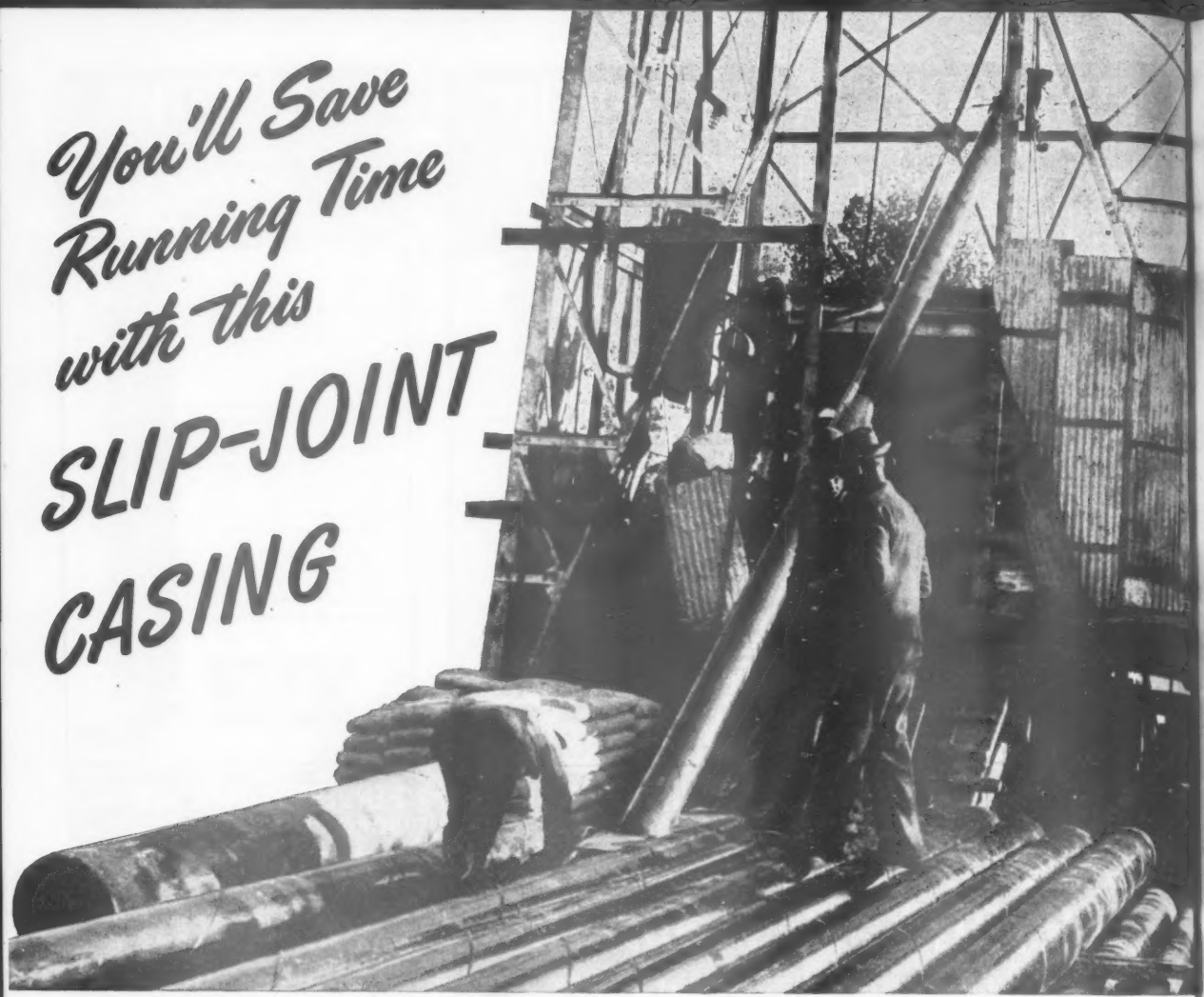
# You'll Save Running Time with this SLIP-JOINT CASING



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Keep in mind too that ARMCO Casing is strong yet light in weight—that you can specify the exact size and weight of pipe needed for the job. Write to our distributor for complete data—or just address tne Armco Drainage & Metal Products, Inc., 2741 Curtis Street, Middletown, Ohio; 501 Mayo Bldg., Tulsa, Oklahoma.

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# Condensate-Well-Corrosion Studies Broadened by N.G.A.A.

**Several agencies will cooperate in pushing three additional investigations of problem**

THE complex problem of equipment corrosion in high-pressure condensate wells is being attacked on a broadened front by a group of cooperating agencies working under general direction of Natural Gasoline Association of America. Entering the second year of an intensive research program, three additional studies, sponsored by the N.G.A.A. corrosion research project committee at University of Texas, have just been announced. Each of the new projects will cover a different but related phase of the over-all problem.

One of the new projects is concerned with a study of surface films on well equipment and will be under the direction of Dr. Norman Hackerman, department of chemistry. This project is to be known as the "N.G.A.A. Corrosion Fellowship." The work will involve an intensive investigation of the physical characteristics of various types of surface layers and the correlation of results with the types of corrosion attack observed in wells. This will require the setting up of sampling procedure, recording of field data from wells, the making of photomicrographs, and classification of various types of corrosion effects. The chemical nature of the films is to be determined by metallographic studies, microanalysis and electron diffraction patterns of these films. Once the character of the films actually encountered in wells is determined, attempts will be made to reproduce them in the laboratory and studies made of ways to combat the corrosive action.

### Objective of Second Project

A second project is concerned with the varieties and concentrations of organic acids and other compounds, such as phenols, in waters taken from condensate wells, and is to be under the direction of Dr. H. L. Lochte, department of chemistry. This work involves the identification of acids through potentiometric titrations, chemical analysis, and quantitative separations made on submitted water samples. Closely allied with this work is a third study under the direction of Prof. William A. Cunningham, department of chemical engineering, which includes the routine analysis of the large number of water samples obtained from both corrosive and noncorrosive wells and from different producing horizons in dual-completion wells. The committee is gathering water samples from many condensate fields in the Southwest and in California.

In discussing the new projects, T. S. Bacon, Lone Star Producing Co., Dallas, who is chairman of the N.G.A.A. corrosion research project committee, stated these new studies would in no way conflict with, nor duplicate, work being done by other cooperating agencies, but would be supplementary to them. "The necessity for finding a solution, as soon as possible, to the very destructive and expensive corrosion in wells of this type is so pressing," Bacon stated, "that every possible avenue leading to that result is to be investigated. The apparent magnitude of the problem has expanded tremendously during the past year. Serious internal corrosion has been found in many new condensate producing areas. One operator has found it necessary to replace an entire string of tubing which had been seriously weakened by internal corrosion after only 7 months of service. Some instances of casing failure have been reported that might be ascribed to this type of corrosion. Field observations as reported a year ago showed corrosion of pipe and fittings to be confined largely to areas close to the well head, while during the past year observations clearly show this corrosion can start at the producing formation and continue on through the flow lines to the plant."

The mechanical difficulties inherent in high-pressure operations have added to the complexities of the

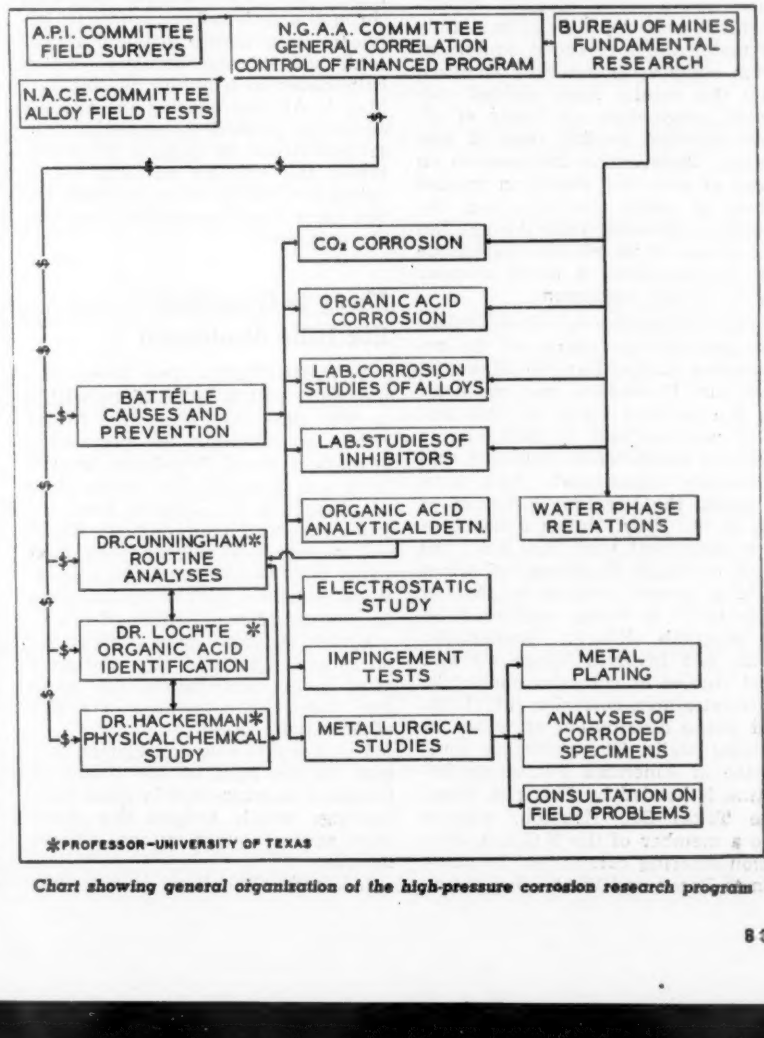


*Chart showing general organization of the high-pressure corrosion research program*



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problem. "They tend to slow the work," said Bacon, "and present a real challenge to the ingenuity of research personnel in finding an economical and workable solution. This comprehensive cooperative program, although costly and necessarily slow, is fundamentally sound and the most logical way for industry to attack the problem."

Studies of the N.G.A.A. committee in the first year of the project were largely in the laboratory but field experimentation is being expanded. Extensive laboratory studies of the corrosive action of carbon dioxide on steel in the absence of oxygen have been made and lead to the conclusion carbon dioxide may be responsible for a large part of the present corrosion. Supplemental studies were made of the effect of addition of organic acids to carbon dioxide and of the effect of various inhibitors. A satisfactory analytical procedure for quantitative determinations of the amount of organic acids present in well-head waters has been perfected and is now being used in field surveys. Investigations have also been made of the effect of electrostatically charged particles in high-pressure gas streams, using an instrument developed by Battelle Memorial Institute, and a series of field experiments is now in progress. In a study of metal alloys corroded equipment from many wells has been analyzed and the results have yielded valuable conclusions on kinds of alloys resistant to this type of corrosion. Quantitative information on rates of corrosive attack on various kinds of alloys also has been obtained in flowing wells through development of an effective technique for the exposure of metal coupons in well-head equipment.

The accompanying chart shows the general organization of the cooperative study. Battelle Memorial Institute, Columbus, was consulted on the problem early in 1944 and later was retained by N.G.A.A. to conduct fundamental research and laboratory experiments. The work is under the personal direction of Dr. H. A. Pray. Under a cooperative agreement with N.G.A.A., the work of the U. S. Bureau of Mines is of a nature similar to that at Battelle. It is being conducted by C. Kenneth Eilerts, Bartlesville, Okla., and involves laboratory and field studies of corrosive materials, resistant alloys, corrosion inhibitors, and phase distribution of water in flowing wells. The corrosion committee of American Petroleum Institute is headed by Frank S. West, The Texas Co., Houston, who is also a member of the N.G.A.A. corrosion steering committee. In addition to Bacon and West, other members of the N.G.A.A. steering committee are: T. W. McGuire, Cotton Valley Operators Committee, Cotton Valley, La.; L. B. Wood, Phillips Petroleum Co., Bartlesville; and W. E. Winn, Sun Oil Co., Dallas. Well-head testing of various alloys in the gas streams of corrosive wells is a project of National Association of Corrosion Engineers under the immediate direction of Walter F. Rogers, Gulf Oil Corp., Houston.

## Mississippi Issues State Well-Spacing Regulations

JACKSON.—Moving promptly on receipt of notice that federal well-spacing regulations were to be revoked September 1, the State Oil and Gas Board of Mississippi issued, effective August 30, its own statewide spacing rules for oil, gas, and condensate wells.

The new rules, issued as Order 4-45, provide minimum spacing for oil wells of 40 acres, and 320 acres for gas and condensate wells. Provisions for exceptions are provided, as are also the usual qualifying regulations regarding the actual location of the well within the drilling unit.

The way for this prompt action had been previously prepared through a series of consultations between state authorities and representatives of the industry, which culminated in a public hearing last May 1. At that hearing the various operators presented suggestions for several fields. In general these followed the existing patterns established by federal rules, as these too had been fixed in consultation with the operators.

## Navy to Consider Elk Hills Shutdown

WASHINGTON.—The Navy Department will hold hearings within a few days to determine future policy on handling the production of oil from Naval Petroleum Reserve 1, it was learned this week. Rate of production has already been cut from the wartime peak of 65,000 bbl. a day to 15,000, and the next move may be to cancel the authority of Standard Oil Co. of California to produce from its share of oil.

Under the unit plan contract of operation, approved by Congress after long consideration, the Navy may take this step after a notice of 90 days.

The Navy is now considering this step, in the light of the intent of Congress as expressed in committee hearings which hedged the Navy with several qualifications. These include:

1. Whether the Navy is currently producing oil for defense purposes. At this time, Navy is not.

2. Whether the 15,000 bbl. daily rate is needed by Standard to fulfill commitments for naval, military or other national requirements in the West Coast area. Standard may show that it is necessary at the present time.

3. Whether the supply situation on the West Coast appears to require the production.

4. The quantity of oil Standard has withdrawn on account of its own share and the expenses Standard has borne.

5. Whether Standard has withdrawn in its own account a quantity of its share of oil from the field which is deemed by the secretary of the Navy to amount to a fair and reasonable consideration for surrendering continued production. Standard is prohibited from withdrawing more than one-third of its total share of the oil in the reserve.

# DEATHS

**Frank W. Merrick,** 82, pioneer oil operator, died August 31 in Ardmore, Okla. Merrick's first oil activity consisted in dipping crude off creeks in the Triumph field, near Titusville, Pa. In 1913 he went to Ardmore, acquired a 20-acre lease and with associates expanded his interests to North Texas. Two years ago the group sold their holdings for a reported $4,000,000.

**S. D. McIlroy,** 75, oil operator in Amarillo, Tex., for the past 45 years, died August 26. McIlroy went to the Klondike in the gold rush of 1897, but returned to Texas to enter the oil business. He organized Dixon Creek Oil Co. with his brother, W. W. McIlroy. It became King Oil Co., of Wichita Falls, in 1932, with S. D. McIlroy as president.

**Duke Phillips,** landman for O. W. Kellam, Laredo, Tex., operator, died recently.

**Giles A. Penick,** 65, Tulsa oil operator and lawyer, died August 31. Going to Oklahoma Territory in 1904 as an employe of the federal land office in Muskogee, he moved to Tulsa 9 years later as attorney for Cosden & Co. Later he engaged in the oil business for himself, continuing to practice law.

**Philip S. Graver,** 67, vice president of Graver Tank & Manufacturing Co., East Chicago, Ind., died August 12. He had been associated with the company 50 years.

**Thomas B. McFadden,** 78, retired drilling contractor, died August 18 at Barkeyville, Pa.

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# Special Mechanical Safeguards Installed On Deep Drilling Rig

**by Neil Williams**

**Safety measures in use on this large steam-powered rig include dual installations for main operating units. Among these are an auxiliary and standby draw works and engine, a spare rotary, an extra swivel, and duplicate main mud-circulating lines as well as steam lines in some cases. Steam power for the rig is supplied by five 125-hp. 350-psi. working-pressure boilers, equipped with automatic water level, fuel feed, and blower controls.**

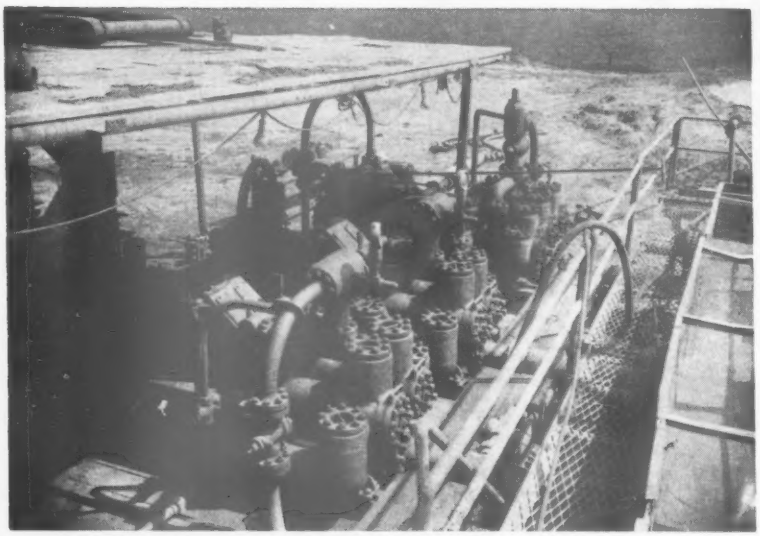

*Fig. 1—Mud pump installation on Superior rig including triplex pump (rear) and two 20-in. stroke duplex pumps. Shown (on first pump) is the dual discharge connection to the two mud lines, and gravity flow suction lines from steel mud pit (right)*

IN this article are described some of the special mechanical safeguards provided by Superior Oil Co. of California on its heavy-duty steam rig recently employed in the drilling of a deep wildcat test in Blaine County, western Oklahoma. They were devised as a means of minimizing the hazards and possibilities of shutdowns or other delays in drilling because of mechanical failures or formation difficulties and make possible more effective utilization of rig time, faster drilling and greater hole protection. Similar precautions are embodied in other deep drilling rigs operated by this company. They reflect the efforts of operators generally to provide larger and more adequate facilities to handle the increased loads

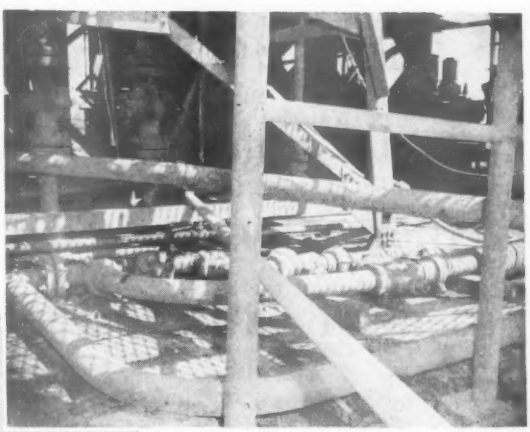

*Fig. 2—(Right) Mud-line manifold and header to the two standpipes. Visible behind second line is bypass for alternate flow while making repairs or connections on main line*

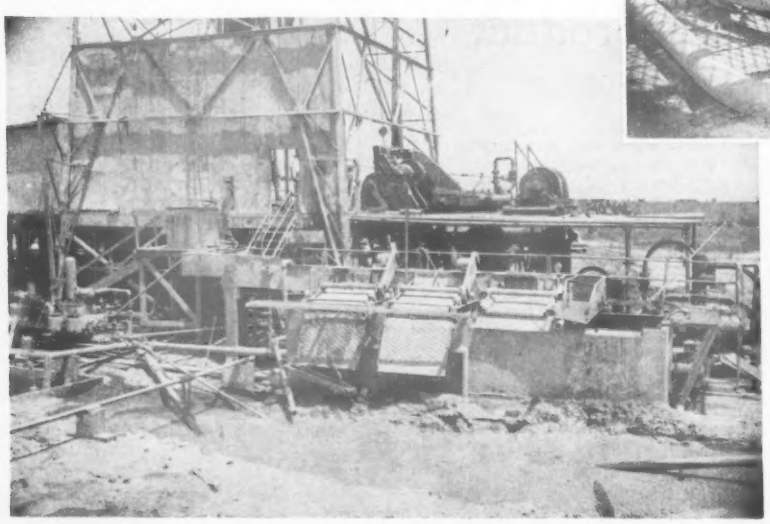

*Fig. 3—(Left) Steel suction tank showing unitized triple shale-shaker installation mounted on top with steel mud ditch along back, and ditch extension bypass around shakers. Main circulating pumps are back of tank with mixing pump at extreme left. On the derrick floor is the auxiliary draw works and wire-line reel with single engine drive. In foreground is auxiliary earthen mud pit*

and overcome the added problems at the greater depths.

The rig, although not new, was one of the largest and most complete steam-powered assemblies ever operated in Oklahoma. Wherever feasible, dual installations were provided for main operating units. These included an auxiliary and standby draw works and engine (Fig. 6), a spare rotary, an extra swivel, two standpipes and ample mud circulating and steam generating capacity to take care of most any contingency that might arise. In addition main mud circulating lines, as well as steam lines in some cases, were duplicated to permit continuous operation should one line break or have to be cut out for repairs.

Use of the auxiliary draw works has been standard practice of this company on all its deep-drilling steam rigs. Although the unit is not as large as the main draw works and engine and not adequate for regular use when drilling at the lower levels, it is capable of getting the pipe out of the hole in an emergency should something go wrong with the main unit. In such a case it might be the means of preventing sticking the pipe and a fishing job, or possible loss of hole. The unit serves another important function in that, being the anchorage for the normally dead-end of the drilling line, it is used to pull the line over to change its working position on the drums and in the blocks. This saves much time and trouble in this operation, which prolongs the serviceable life of the line.

While many operators question the justification of the auxiliary draw works from the standpoint of the additional investment involved and added transportation and moving costs, considering the reliability of modern equipment and small chance of failure, it is the contention of Superior that the saving of one deep hole or the prevention of a major fishing job, would more than pay for it. The additional unit ordinarily is an old, obsolete type, as in this case, that would not be used normally in regular service, and consequently the investment tied up is not great.

### Auxiliary Draw Works

The auxiliary draw works located on the opposite side of the derrick floor from the main unit, is driven by a 12-in. by 12-in. twin engine. Additional use of this engine is made to drive the wire line coring and sand-line reel, located behind it. This is done through a secondary drive which can be disengaged quickly for operation of the auxiliary draw works. In this hookup the engine is not surplus equipment as it saves a separate engine installation for the reel. The main draw works which is a large, modern, unitized type, is driven by a 14-in. by 14-in. twin engine.

The spare rotary and extra swivel are precautions against prolonged shutdowns of the rig in event the regular units would have to be sent to machine shop for repairs. They are kept on location with the rig and are available for quick setting up at any time. It is considered that one shutdown even for only a few hours for shop work would cost in idle rig time more than the cost of having the spare units.

The rotary is driven by a separate engine located below the derrick floor.

With the rig is a 176-ft. steel derrick above the derrick floor with an 11-ft. substructure, making an overall height to the crown of 187 ft. Base of the derrick at the derrick floor is 32 ft. square, providing large working space for handling and racking the long strings of pipe. The height and clearance of the derrick permits pulling pipe in thribles, an important factor in reducing trip time, and thus making more effective utilization of rig time in making hole. The substructure is incorporated as a part of the derrick with the corner legs being extensions of the derrick legs, giving a 34-ft. square base at the ground level.

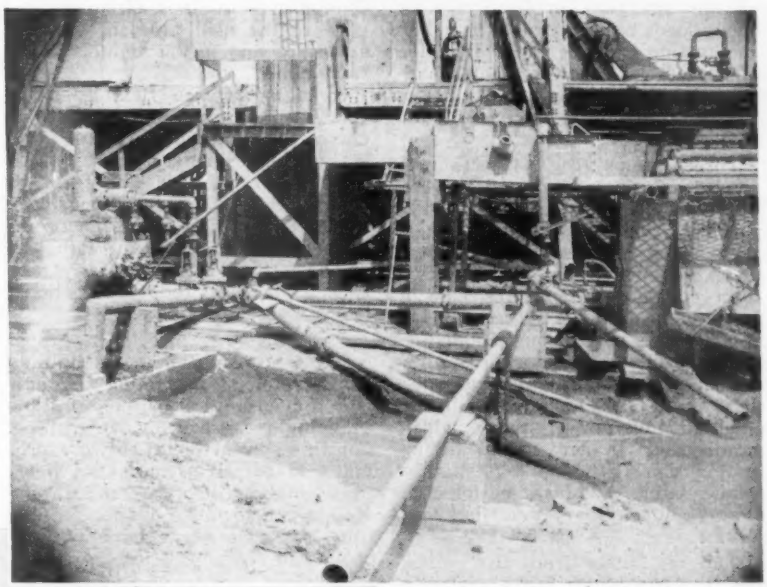

*Fig. 4—(Right) Closeup of suction hook-up to mixing and auxiliary pump from base of steel suction tank, the auxiliary earthen mud pit and mixing pit (left). Visible is portion of pump discharge header showing one outlet line to mud ditch above*

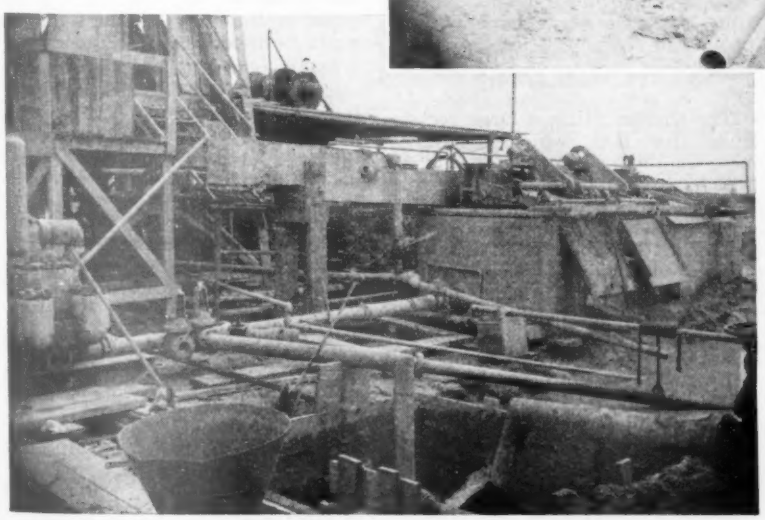

*Fig. 5—(Left) Mud-mixing hookup showing mixing pump (left), mixing pit and hopper (foreground) with gravity-flow outlet from steel reserve mud tank (not shown at right). Back of mixing pit is auxiliary mud pit with steel suction tank at left*



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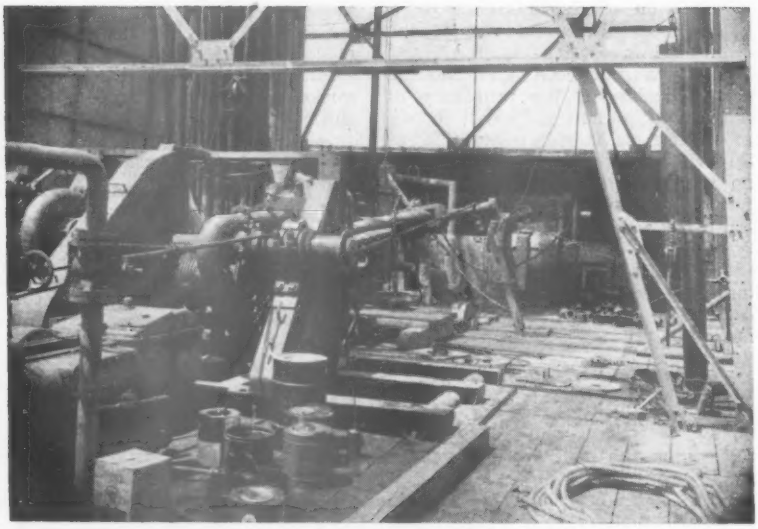


*Fig. 6—Derrick floor showing main draw works under housing at rear and auxiliary hoisting unit at left*

This not only adds to the strength of the structure in handling the heavy loads but is a saving in moves and setting up. The 11-ft. elevation of the derrick floor facilitates handling and working around the heavy blowout prevention equipment and well connections.

Three pumps (Fig. 1) were provided exclusively for mud circulation, insuring adequate reserve pumping capacity for any emergency. One of these was a triplex pump, this being augmented by two 20-in. stroke duplex pumps. One of the latter usually served as a standby with the triplex pump and one 20-in. normally being adequate for regular use. Manifolding was such that any of the pumps could be operated singly, or any two, or all in parallel, or in any compounding combination. A fourth, but slightly smaller pump, was installed for mud mixing and auxiliary mud handling service.

Dual mud lines from the pumps and two standpipes made available an alternate means of mud circulation to the hole in event of a break or need to repair or replace a valve or fitting in a line. Pump discharges were connected to both lines, either of which could be used by any or all the pumps. The two lines were manifolded to a common header (Fig. 2) to the two standpipes so that mud circulation through either line can go to either standpipe. In addition, one of the mud lines is provided with a bypass through the header in case repairs in the manifolding and header become necessary.

In the hookup, it would be possible in an emergency, such as need to control high pressures, to make connection with one of the lines to the annulus and by splitting the pumps to both lines, circulate mud both to the drill pipe through one standpipe and to the annulus at the same time.

A high pressure flexible, swing joint steel rotary hose was used as one of the standpipes. On the other was a standard rotary hose.

Wherever possible, all turns in mud and also steam lines were made with wide angle sweeping pipe bends rather than with "T" or sharp angle fittings (Figs. 1 and 2) as a means of reducing frictional losses in pressure.

Emphasis was placed on proper control and conditioning of the mud as a means of protecting the hole and preventing formational trouble that might cause delays in drilling. For this special facilities were provided to permit a maximum flexibility in handling the mud in the system and to make available at all times an adequate volume of mud of desired characteristics.

### The Suction Pit

The suction pit is a large rectangular steel tank, which is unitized with the three shale shakers (Fig. 3), which are permanently mounted on top to facilitate moving and setting up. Clean mud drops through the shaker screens directly into the top of the tank while refuse cuttings are discharged over the side directly into an auxiliary earthen pit from where they can be jetted to the refuse pit. Mud outlets to pump suction are at the bottom of the tank permitting gravity flow to pump suction and thus increasing the efficiency of the pumps. Mud returns from the well are circulated to the shakers through a steel ditch which extends the length of one side of the top of the tank with openings to each of the shakers. By means of baffles in the shaker openings, the mud stream can be directed to any or all the shakers as desired. In addition, the ditch has an extension (Fig. 3) around the shakers so that the mud stream can be bypassed to an auxiliary earthen pit. That portion of the ditch along the top of the tank serving the shakers also is unitized with the tank and shakers and does not have to be dismounted for moves.

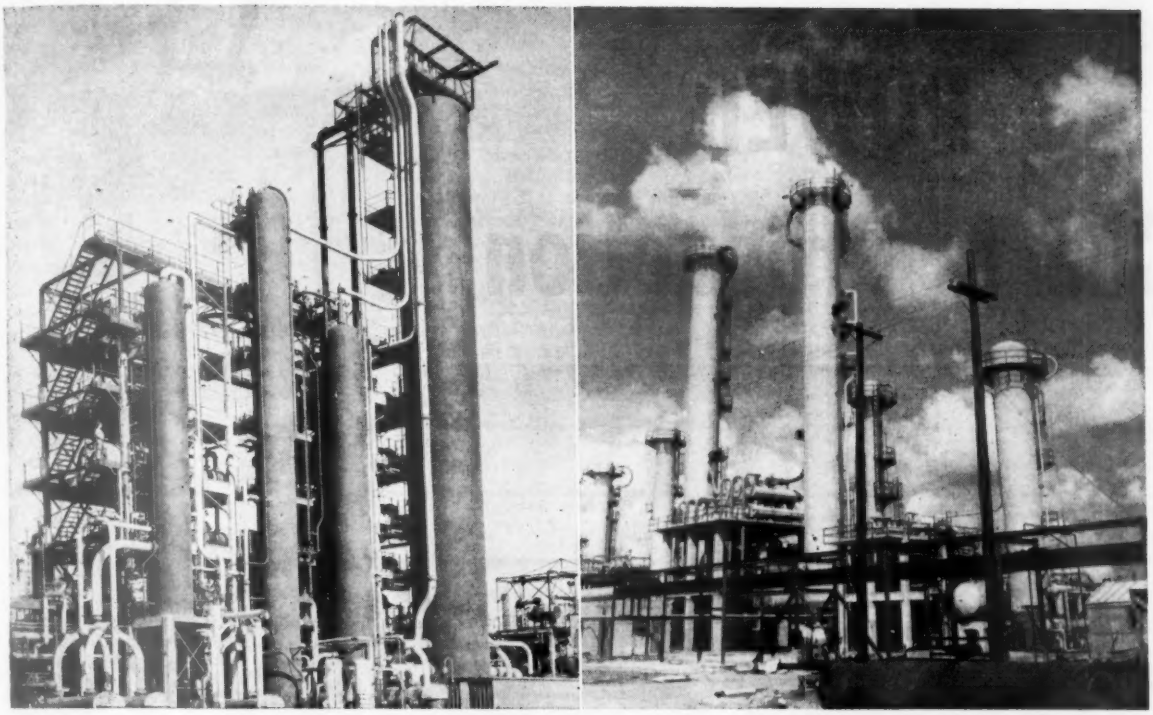
An outlet in the bottom of the suction tank also is provided to the suction of the mud mixing pump (Figs. 4 and 5) to permit emptying the tank to any other pit to change the mud in the system. Also, since the mixing pump has a discharge line to the top of the tank, the mud in the tank can be "rolled" continuously to maintain its uniform consistency.

Suction lines from the auxiliary earthen mud pit and a separate mixing pit also are manifolded to the suction of the mixing pump (Fig. 4 and 5) so that new mud can be circulated from either of these sources to replace or augment the mud in the well circulatory system. An additional large steel reserve tank also was located adjacent to the system with a bottom gravity outlet direct to the mixing and auxiliary suction pit, making available an adequate reserve supply of mud for any emergency.

The discharge of the mixing pump is manifolded both direct into the mud ditch to the suction tank, mud guns for the latter tank, each of the other pits, and the reserve tank, permitting transfer of the mud from any part of the system to another, or for operation of mixing guns at any of the pits. As a precaution against any mechanical failure on the part of the mixing pump, discharge of the regular circulating pump has a connection to mixing guns so that any of these pumps could be used in an emergency.

Steam power for the rig was supplied by five 125-hp. 350-psi. working pressure boilers. These were equipped with automatic water level fuel feed and blower controls, insuring maintenance of full steam pressure on the system at all times. With the five high pressure boilers adequate reserve steam generating capacity was available at all times for this purpose, allowing for the shutdown of any boiler for washing or repairs.

**Gene E. Abernathy** is now in the West Texas-New Mexico area as petroleum engineer for Phillips Petroleum Co. He joined Phillips last December and designed and installed the company's water plant at West Edmond.



*(Left) Sulfuric acid alkylation unit of Pan American Refining Corp., Texas City, Tex. (Right) HF alkylation unit at refinery of Abercrombie—Harrison Co., Sweeney, Tex.*

# Catalysts Employed in Hydrocarbon Alkylation Reactions

***by Arch L. Foster***

**PART 2 OF A SERIES**

**Alkylation is a relatively newly discovered reaction which superseded those of polymerization followed by hydrogenation. Catalysts most used commercially are anhydrous hydrofluoric acid and the older sulfuric acid catalyst. Other catalysts are phosphates boron fluoride, aluminum chloride, sulfates, phosphoric acid, etc., according to published technical and patent literature cited in this second article of a series.**

THE first alkylation-type reaction to be carried out extensively by organic chemists is that known as the Friedel and Crafts reaction, from its English discoverers. This reaction uses anhydrous aluminum halides, especially the chloride, with or without a hydrogen halide, as catalyst. The reaction is used widely in chemical manufacture, for preparation of complicated hydrocarbons and their derivatives, especially halides, alcohols, etc. However, it has not been used widely in the petroleum-refining industry.

For the synthesis of hydrocarbons other halides than that of aluminum are recommended by a German researcher (2-116). $AlCl_3$ is considered to catalyze the junction reaction through an intermediate alkyl chloride, in the reaction between aromatic ring structures and olefins or paraffins, or by means of a surface reaction on the solid chloride. Anhydrous gallium chloride is reported to form the addition product direct, without formation of the intermediate compound. It shows a high initial reaction rate, reacting 100 mols of olefin per mol of catalyst. Indium chloride, $InCl_3$, does not catalyze this reaction, although indium is an element higher in Group 3, the $R_2O_3$ type elements; it has a molecular weight of 114.8 while gallium is 69.72, and aluminum is 26.97.

For more recently developed commercial processes, that employing sulfuric acid as catalyst, and the newer one using anhydrous hydrofluoric acid represent the total commercial capacity operated at present, at least among the military Allies opposing Germany and Japan. Sulfuric acid has been in use longer than HF, and this process was developed by several companies working more or less in collaboration, or at least during the same time period, among them being Standard Oil Development Co., Anglo-Iranian Oil Co., and M. W. Kellogg Co. Numerous improvement patents have been issued relating to additions to this primary catalyst. A temporary compound appears to be formed between the catalyst and the olefinic component of the reaction mixture, which later breaks up with combination of the olefin and isoparaffin present. Ruthruff (2-121) mixes a small amount of a mercury compound and of a selenium compound



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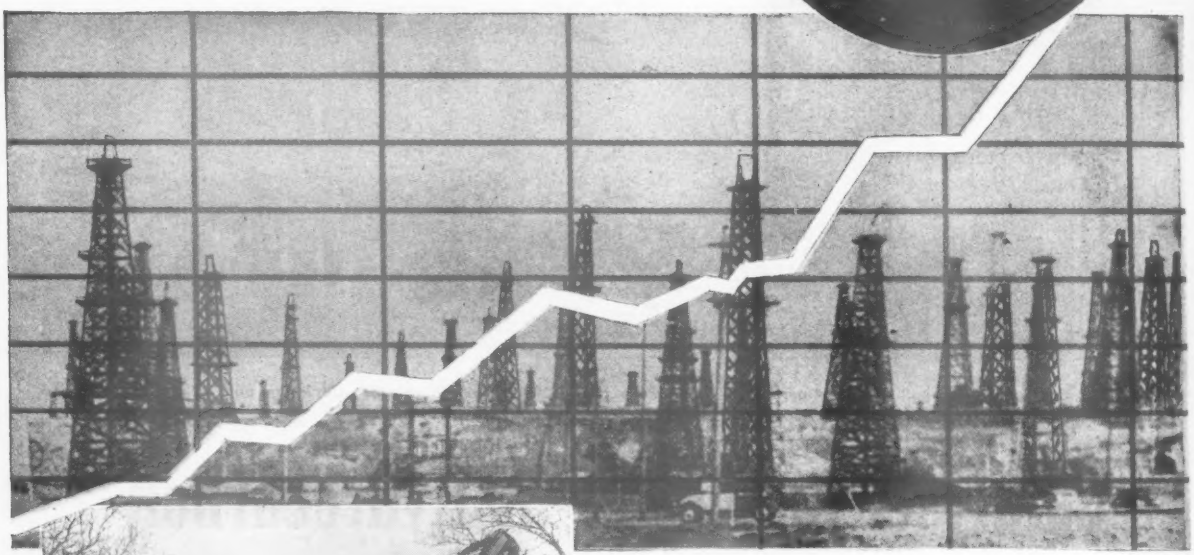

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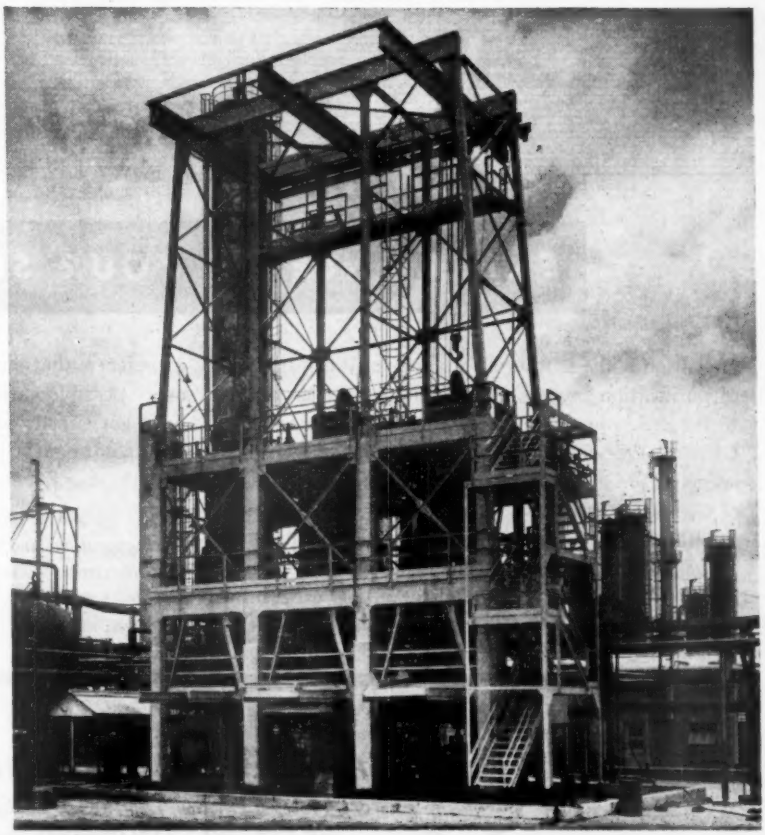
with concentrated $H_2SO_4$ to form a catalyst for alkylating i-butane or benzene with olefins. Tertiary olefins are reacted with phenol, $C_6H_5OH$, in the presence of (2-127) sulfuric acid or an alkyla sulfate. Ruthruff (2-130) also combines concentrated sulfuric with small amounts (as 0.1 per cent) of promoters, such as selenium dioxide, and a sulfate of nickel, silver, or copper to promote alkylation reactions. An organometallic compound such as lead tetraethyl (2-133) is also combined in small proportions with sulfuric acid as an improved alkylation catalyst. A small amount of a salt in the first transition series, Periodic Group 8 such as cobalt sulfate, $CoSO_4$ (2-139), is added to the acid as a catalyst promoter. An interesting combination or variation in this regard is the generation of a catalyst in situ by treating a fluoride, as $CaF_2$, with a strong acid such as concentrated sulfuric (2-141). A more recent patent (2-145) advocates use of sulfuric acid in varying strengths as an efficient alkylator. Shell (2-147) treats sulfuric acid with 85 per cent formic or tartaric acids at 50-150° F., later separated by distillation. It is claimed that a higher concentration of olefin may be employed with this catalyst. Compound catalysts, or catalyst mixtures, are made by mixing sulfuric of 90 per cent strength with chlorosulfonic acid (2-150) and treating at 100° F. Into the same category goes the use of fluosulfonic acid (2-128) as alkylation promoter. To increase catalyst life it is recommended that "an inorganic sulfur acid" be used as catalyst and treat the reactants before they reach the catalyst with a hydrocarbon-insoluble, strong carboxylic acid (2-156) to increase the life of the catalyst. An analogous procedure is recommended with sulfuric acid as catalyst (2-157) by treating the olefin part of the charge with cuprous chloride, $Cu_2Cl_2$. A Canadian patent calls for treating reactants with HCl added to the mixture of the two, then bringing into contact with concentrated sulfuric acid at 10-30° F. (2-158). The concentration of sulfuric may vary from 87 to 100 per cent (2-162) for alkylation catalysis, treating refinery gas fractions at 30-100° F. A combination of two distinct types of catalyst is claimed (2-159) by mixing sulfuric acid with boron halide, as the bromide or fluorite, for example. Efficient reclamation of a catalyst is necessary generally to an economical operation. Sulfuric acid forms byproduct compounds with hydrocarbons which render it unfit for further catalytic use unless reclaimed. Frey and Cole (2-119) recommend diluting the spent catalyst with ice to 1.5-4 volumes, separating out the oil floating on the surface, steaming out other undesirable liquids and concentrating the acid to 95 per cent or higher by conventional processes.

Although anhydrous hydrofluoric acid went into commercial use as an alkylation catalyst after the start of the war, a considerable patent literature has been built up. Many patents are under secrecy orders until the end of the war and cannot be introduced here. Two patents issued early in the war (2-122) claim aqueous solutions of HF instead of the anhydrous form, which solutions are saturated with boron trifluoride. Olefin-isoparaffin mixtures are treated with this catalyst at 100° F. Egloff and Linn (2-124,-125) mix an alkyl fluoride such as i-propyl fluoride, with HF and treat isoparaffins therewith at 20° C. (68° F.). Plain HF is claimed by Frey (2-131) to act on $C_3$s and $C_4$s for aviation fuel. Grosse and Linn (2-134) mix HF with the isoparaffin in a reaction zone and introduce olefins at successive stages; also HF is added in the same manner. Anhydrous HF and $BF_3$ mixtures are used to alkylate cycloparaffins with olefins to form alkylcycloparaffins (2-144). Peculiarly enough, an efficient alkylation catalyst is claimed (2-148) to be a saturated solution of $BF_3$ in water, $BF_3$ being a colorless gas at normal temperatures (2-155). The effect of metals is introduced by treating alkylation reactants with anhydrous HF, liquid, in a reaction zone made of an iron-nickel alloy containing at least 50 per cent Ni (2-153). Boron fluoride is used in solution in orthophosphoric acid (2-154) to alkylate tertiary C-atom-containing hydrocarbons with mono-olefins. Still other claims are made for an alkylation catalyst composed of $BF_3$, water, and HF (2-161). While these references by no means exhaust the literature they serve to illustrate the variants involved. Release of secrecy controls over many recent patents will disclose other catalyst compositions. This field is in its infancy as regards commercial peacetime operations, and further developments in catalysts containing HF may be expected.

### $AlCl_3$ a Versatile Catalyst

Few catalytic materials have displayed the wide application to different types of reactions that anhydrous aluminum chloride shows. Brought into prominence by the coworkers, Friedel and Crafts, during the last century for combining aliphatic with aromatic hydrocarbons or derivatives, this compound has been developed as a catalyst for hydrocarbon cracking, alkylation, isomerization and in fact has been

*Stratford contactors, HF alkylation unit, at Associated Refineries, Inc., Duncan, Okla.*





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claimed to promote other reactions as well (3-173), such as polymerization of olefins, etc.

$AlCl_3$ is used to effect reaction between organometallics and aromatic halides, to make aromatic ketones, such as benzophenone (2-118). Frey (2-123) claims an alkylation catalyst composed of $AlCl_3$ plus "a substantial portion" of an alkali halide, used at 100-400° F. and 100 psi. A supported catalyst is made (2-126) by heating activated bauxite at above 140° F. with Al halide to react with the "bound water" of the bauxite; the hydrogen halide so formed is removed and $AlCl_3$ hydrates are decomposed by heat, followed by impregnation of the purified and dehydrated bauxite with more anhydrous $AlCl_3$ or other halide. McAfee and Dunlay (2-132) introduce a phenol as a catalyst aid or promoter to alkylate isoparaffins with olefins using aluminum chloride catalyst. Introduction of a nitrogen-base hydro-halide such as the hydrogen chloride salt of pyridine to 66 per cent of anhydrous $AlCl_3$ is claimed to be an efficient, long-lived alkylation catalyst (2-142). Aluminum chloride as such is difficult to keep in physical condition which permits easy and intimate contact of catalyst and charge; one method of improving this condition is to form a hydrocarbon complex with the chloride, a product which is liquid at ordinary reaction temperatures (2-142). Such a catalyst mass is made with anhydrous $AlCl_3$ and isooctane, which latter may or may not enter into the alkylation reaction, at 175°-215° F. and 15-600 psi. The now most conventional and widely used metal chloride catalyst for several reactions is $AlCl_3$ plus a small percentage of HCl or other hydrohalic acid (2-146). This combination is used frequently for a number of reactions, at different temperatures, concentrations. In fact it has been found that for most reactions in which it figures as a catalyst $AlCl_3$ alone is a poor catalyst; it must be combined with HCl and some researchers believe that the two molecules combine to form $HAlCl_4$ which ionizes, the $—AlCl_4$ radical being the active catalyst principle.

Other complexes are formed, such as that with $AlCl_3$ and varying proportions of alkali metals; $AlCl_3$:NaCl, in ratio of 1.8:1; KBr:$FeCl_3$, etc., on carriers. A dehydrogenation catalyst, as $SiO_2$-$Al_2O_3$-$Cr_2O_3$, may be mixed with chloride complex and the mass used on iso and normal paraffin mixtures at 400° F. and 3,000 psi. (2-151). In another instance $AlCl_3$ is mixed with a hydrogenation catalyst such as copper oxide, and mixed with the charge stock in the same zone (2-152).

In addition to these catalysts which are most commonly recommended, a large number of other materials are claimed either in technical or patent literatures. A Russian technologist (2-117) claims to obtain excellent results from the use of catalysts made up of an "Al silicate surface" evidently a supported $AlSiO_3$ catalyst, which he says either alkylates or dealkylates aromatics at 400-430° C. (752-806° F.) with six seconds exposure. An acid phosphate of an alkaline earth metal, at 100-450° C. (212-842° F.), is claimed (2-120) as an alkylating agent for reacting ethylene, propylene, etc., with aromatics such as benzene. It is noticeable that temperatures and pressures mentioned in the literature are much higher when certain types of catalysts are discussed, than when dealing with the more common chloride, sulfuric, and hydrofluoric acid catalysts mentioned above. An American refining company claims the use of a mixture of fluorspar (calcium fluoride) and chromic oxide (2-129) as alkylation catalysts. A distinct similarity exists here, with HF, since the fluorine ion is present. A number of patents have been issued for the use of $Al_2O_3$-$Cr_2O_3$ or with $MoO_3$, (2-135) to effect alkylation of i-paraffins and olefins at 375°-950° F. with 5-15 per cent of water or hydrogen sulfide as promoter. Oxides of vanadium or any Fifth Group metal supported on alumina are also reported to show alkylation catalyst powers. Alkylation of benzene with propylene, etc., in the presence of an aluminum hydrosilicate (2-136) is claimed by a German scientist.

Aromatic alkylates are produced (2-137) from benzene and propylene using magnesium chloride, $MgCl_2$, supported on aluminum oxide carrier. Temperatures of up to 900° F. and pressures to 16,000 psi. are employed to effect alkylation with catalysts of oxides of molybdenum, chromium, manganese, vanadium, iron, cobalt or nickel (2-138). The same type of catalysts are combined with dehydrating agents such as phosphorus pentoxide, $P_2O_5$, and supported on clays, silicates, etc., also alkylate isoparaffins with olefins (2-149).

A complex catalyst composed of a mixture of boron halide and phosphoric acid, $H_3PO_4$, and a compound of the acid plus an olefin will alkylate efficiently isoparaffins at 20°-60° F., it is claimed (2-160). To aid in control of catalyst temperature and thus of the products of reaction Stratford (2-140) cools the alkylation catalyst systematically by evaporating part of the light—normally reacted — hydrocarbons present in the used catalyst mixture.

### Bibliography of Alkylation Catalysts

Reference, date and publication or of patent issue, and nature of catalyst, follow:


2-116. Synthesis of Hydrocarbons — Z. Elektro, vol. 49, p. 292 (1943), Aluminum chloride.

2-117. Catalytic Alkylation, J. Phys. Chem. U.S.S.R., vol. 17, p. 381 (1943), Al silicates.

2-118. Friedel-Crafts Catalysts, J. Gen. Chem. (U.S.S.R.), vol. 12, p. 398 (1942), Aluminum chloride.

2-119. U. S. 2,287,732, June 23, 1942, Sulfuric acid.

2-120. U. S. 2,290,211, July 21, 1942, Alkaline earth phosphate.

2-121. U. S. 2,295,608, Sept. 15, 1942, $H_2SO_4$, with Hg and Se compounds.

2-122. U. S. 2,296,370 and 2,296,371, Sept. 22, 1942, $H_2O$ sol. of HF plus $BF_3$.

2-123. U. S. 2,296,511 and 2,296,512, Sept. 22, 1942, Al halide plus alkali halide.

2-124. U. S. 2,307,773, Jan. 12, 1943, HF-Alkyl fluoride.

2-125. U. S. 2,307,799, Jan. 12, 1943, HF-Alkyl fluoride.

2-126. U. S. 2,309,263, Jan. 26, 1943, Bauxite-Al Chloride.

2-127. U. S. 2,310,663, Feb. 9, 1943, $H_2SO_4$ or Alkyl sulfate.

2-128. U. S. 2,313,103, March 9, 1943, Fluosulfonic acid.

2-129. U. S. 2,315,129, March 30, 1943, Fluorspar-$Cr_2O_3$.

2-130. U. S. 2,316,108, April 6, 1943, $H_2SO_4$, sulfates of Ni, Ag, Cu, $SeO_2$.

2-131. U. S. 2,322,800, June 29, 1943, HF.

2-132. U. S. 2,323,616, July 6, 1943, $AlCl_3$ plus phenol.

2-133. U. S. 2,324,099, July 13, 1943, $H_2SO_4$ plus organometallic comp.

2-134. U. S. 2,325,052, July 27, 1943, Hydrofluoric acid.

2-135. U. S. 2,326,585, 2,326,586, and 2,326,587, Aug. 10, 1943, Al oxide, chromia, or molybdic oxide.

2-136. U. S. 2,326,799, Aug. 17, 1943, Al hydrosilicate.

2-137. U. S. 2,329,858, Sept. 21, 1943, $MgCl_2$ on alumina carrier.

2-138. U. S. 2,332,276, Oct. 19, 1943, Oxides of Mo, Cr, V, etc.

2-139. U. S. 2,334,106, Nov. 9, 1943, $H_2SO_4$, plus Group 8 metal salt.

2-140. U. S. 2,334,955, Nov. 23, 1943, Catalyst conditioning by evaporative cooling.

2-141. U. S. 2,335,507, Nov. 30, 1943, $H_2SO_4$ plus a fluoride.

2-142. U. S. 2,337,014 and 2,337,015, Dec. 14, 1943, $AlCl_3$ plus organic N-base.

2-143. U. S. 2,338,711, Jan. 11, 1944, $AlCl_3$-hydrocarbon complex.

2-144. U. S. 2,340,557, Feb. 1, 1944, HF + $BF_3$.

2-145. U. S. 2,342,364, Feb. 22, 1944, Sulfuric acid.

2-146. U. S. 2,342,865, Feb. 29, 1944, $AlCl_3$ + H halide.

2-147. U. S. 2,344,469, March 14, 1944, $H_2SO_4$ + Formic or Tartaric acids.

2-148. U. S. 2,345,095, March 28, 1944, Aqueous $BF_3$ solution, saturated.

2-149. U. S. 2,345,704, April 4, 1944, Oxides of Mo, V, etc., on clays or silicates, with $P_2O_5$, etc.

2-150. U. S. 2,348,017, May 2, 1944, $H_2SO_4$ + Chlorsulfonic acid.

2-151. U. S. 2,349,458, May 23, 1944, Metal halide mixtures, $AlCl_3$ + NaCl, etc.

2-152. U. S. 2,355,339, Aug. 8, 1944, $AlCl_3$ + hydrog. cat., as CuO.

2-153. U. S. 2,360,436, Oct. 17, 1944, HF in Ni alloy reaction zone.

2-154. Br. P. 545,441, May 27, 1942, $BF_3$ + Orthophosphoric acid.

2-155. Br. P. 550,711, Jan. 20, 1943, Aqueous saturated $BF_3$ solution.

2-156. Br. P. 553,749, June 3, 1943, Inorganic S-acid, + carboxylic acid.

2-157. Can. P. 415,067, Sept. 7, 1943, $H_2SO_4$ + $Cu_2Cl_2$ as pretreat. "promoter."

2-158. Can. P. 416,027, Oct. 26, 1943, $H_2SO_4$ + HCl pretreat. of olefin.

2-159. Can. P. 423,999, Nov. 21, 1944, $H_2SO_4$ + Boron halide—$BF_3$.

2-160. Can. P. 424,000, Nov. 21, 1944, $H_3PO_4$ + Boron halide.

2-161. Can. P. 424,127, Nov. 28, 1944, HF + $H_2O$ + $BF_3$.

2-162. U. S. 2,300,817 and 2,300,818, Nov. 3, 1943, $H_2SO_4$—87 to 100 per cent conc.




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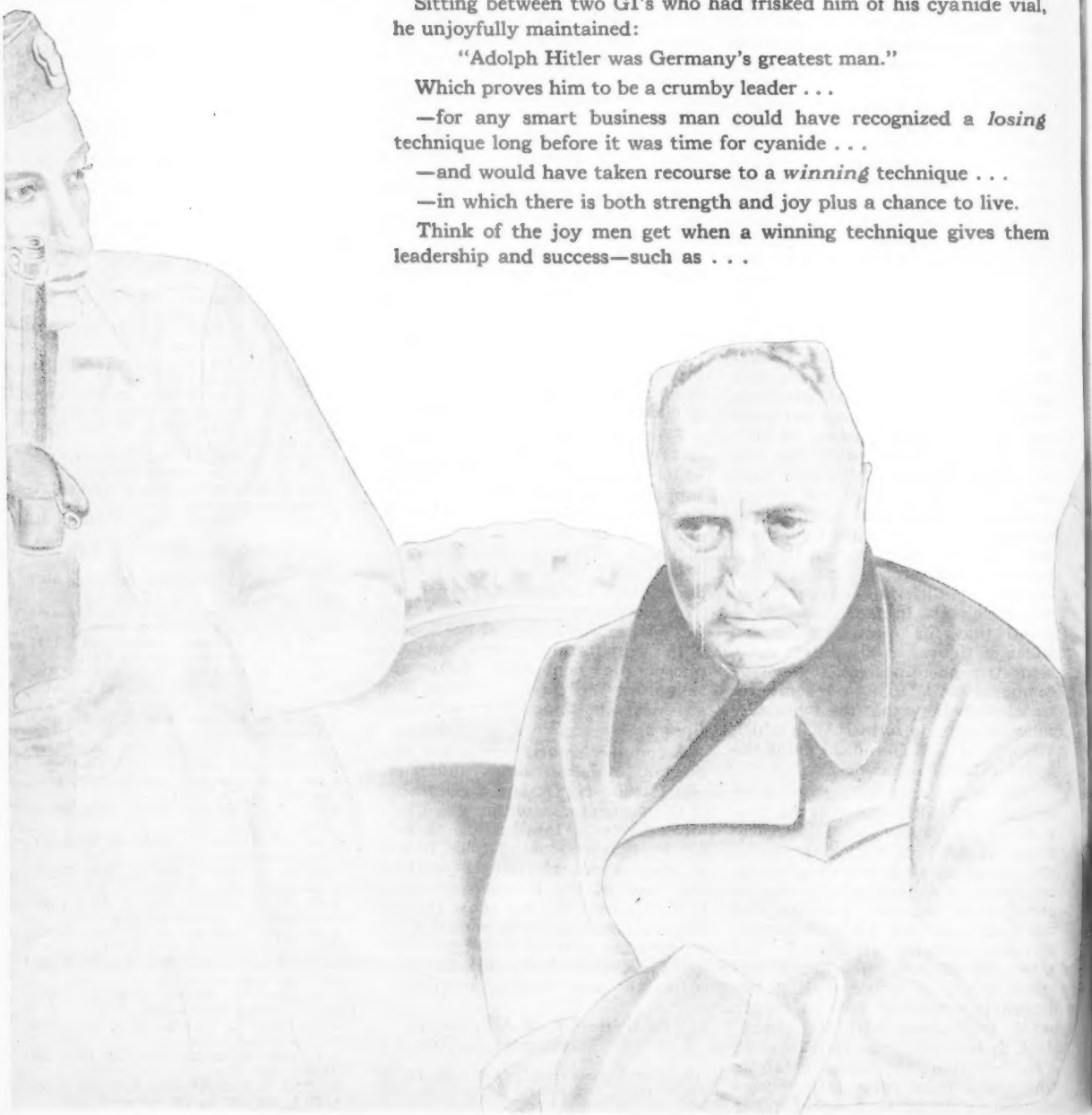

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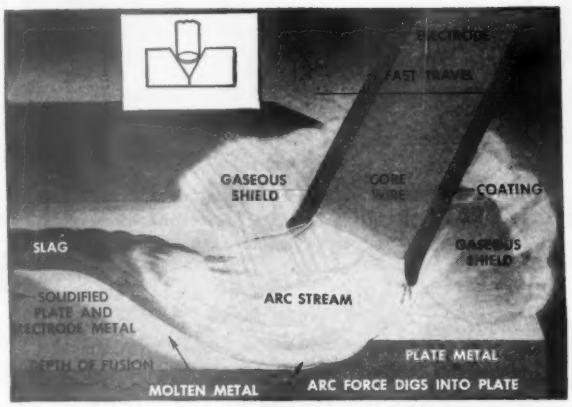


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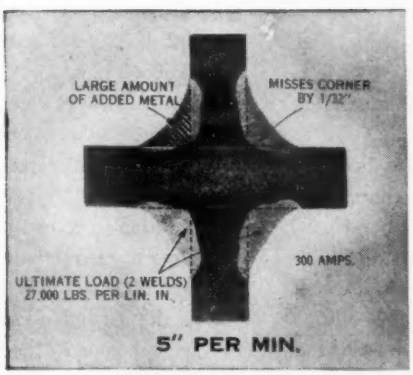


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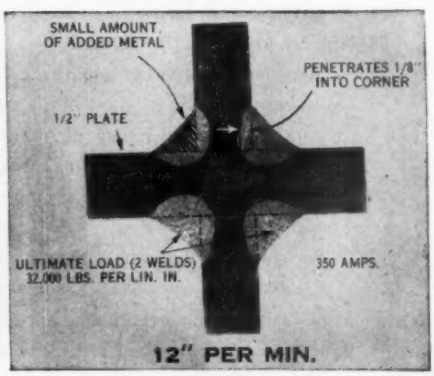
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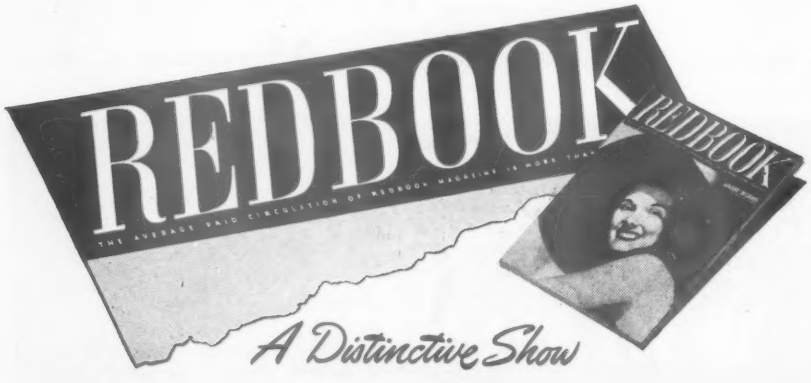


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# Paloma Unit—An Advanced Oil, Gas, And Products Producing Operation

**by Kenneth B. Barnes**

PART 3

**Here last in order but not least in the detailed complex makeup of a high-pressure oil-and-gas-recovery project, are some of the equipment highlights present at Paloma. Other articles on Paloma appeared in issues of August 18 and 25.**

## 9—Instrumentation

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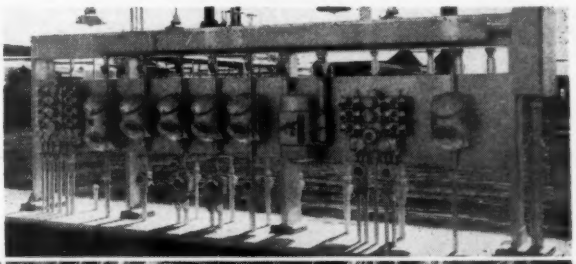
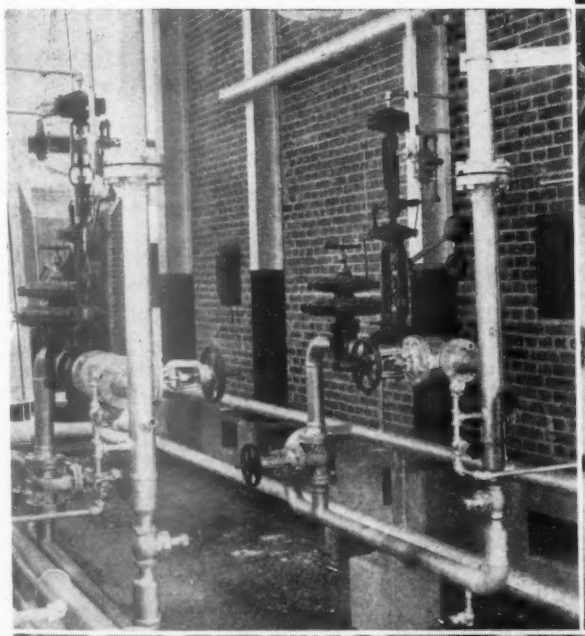
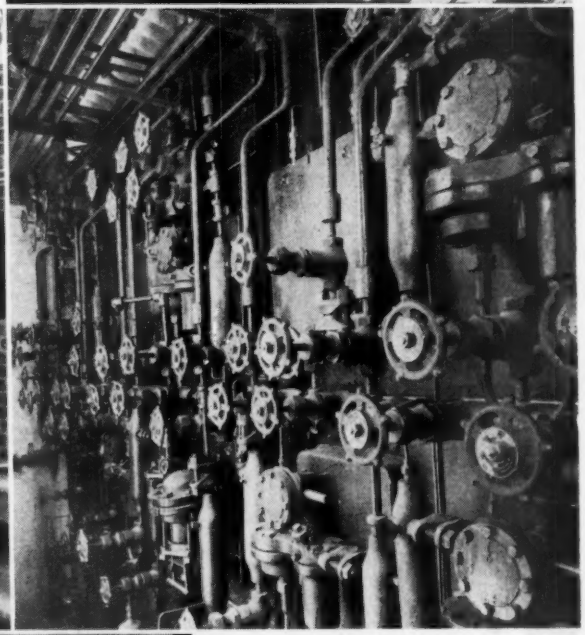
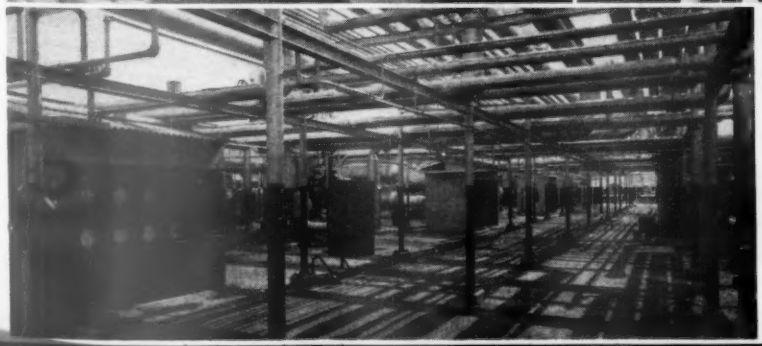
*Right: All motor starters for the pumps and lights serving the condensate storage and loading facilities are centralized on this switch rack. Electrical circuits are in buried conduits*



*Below: Pressure-differential safety-control setup on one of the direct-fired, rich-oil heaters. A decrease in differential below a pre-set amount shuts off the feed and gas supply*

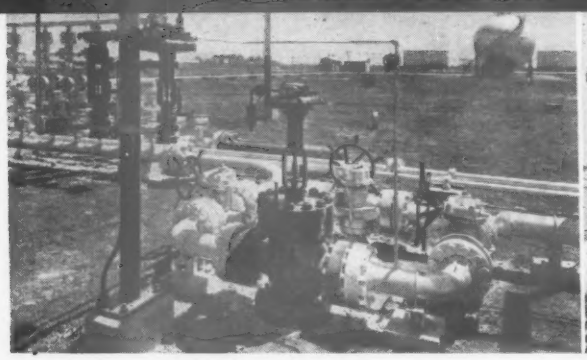


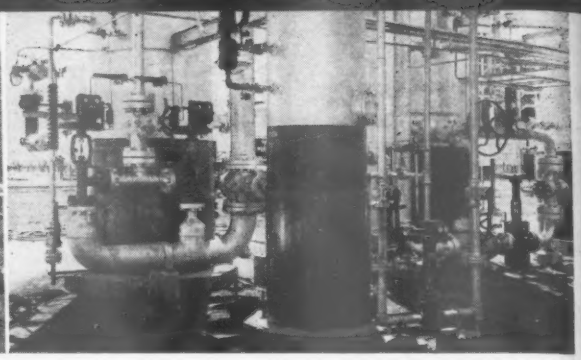




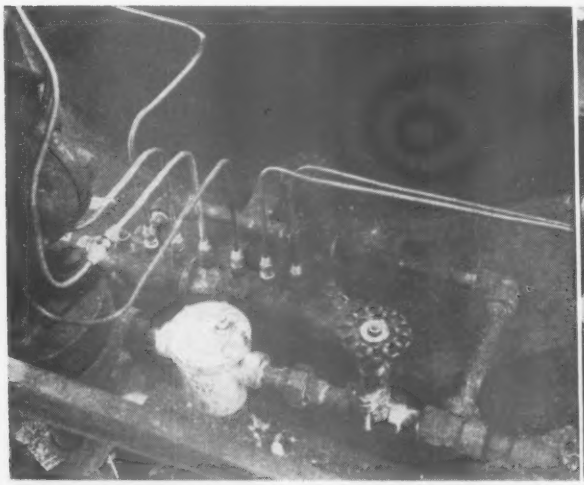
*Above: Extraordinarily neat jobs of high-pressure piping and circuits are found back of the instrument panels. Rear of shelters is enclosed and steam heated to prevent condensation in the lines*

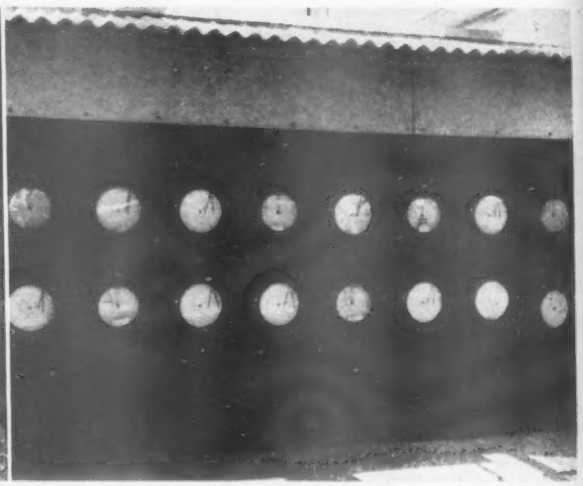
*Left: Paved walkway through column area, showing three of the shelters housing automatic controllers and recorders*





*Left: This master reducing regulator maintains a downstream pressure of 2,000 psi. on the gas entering the plant. It closes automatically if the plant pressure drops below a preset minimum; also, the valve may be shut from two points in the plant by solenoid control as well as by manual operation. Right: High-pressure relief and safety controls on the 2,000-psi. (left) and 75-psi. (right) gas scrubbers. If absorption oil in the scrubbers rises too high, a red light flashes on a panel in the compressor room; an alarm also is sounded. If level continues to rise, the compressors are grounded by mercury switches. All compressor units can be manually shut off from one point*

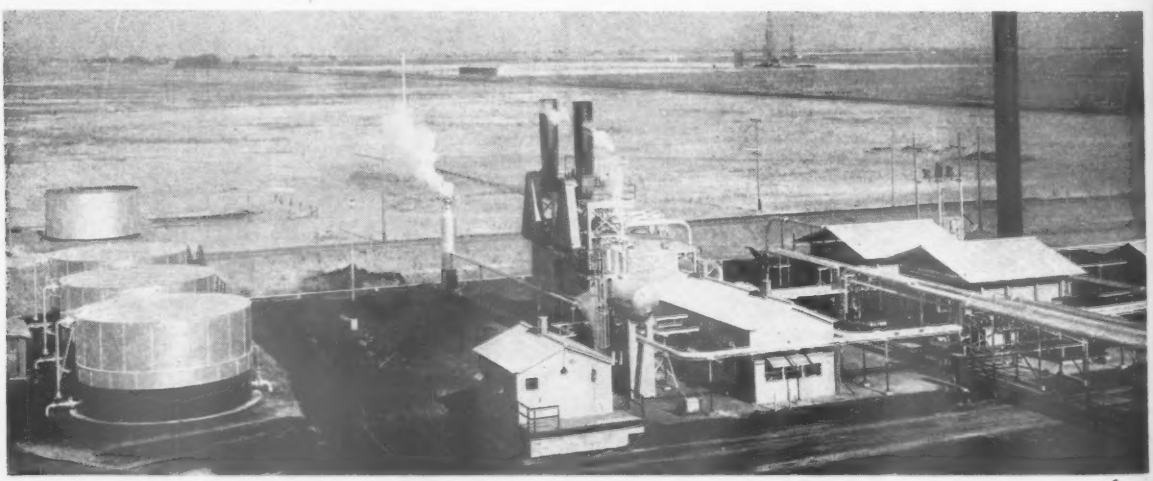




*Left: Many places in the transfer lines would freeze, if bare, because of expansion effect and hydrate formation of the fluids. Accordingly, many valves, fittings, and regulators have been wrapped with steam-conveying tubing, then covered with insulation. Right: Interior of one control shelter, showing instrument panel for the absorbers. (See preceding page for rear view)*

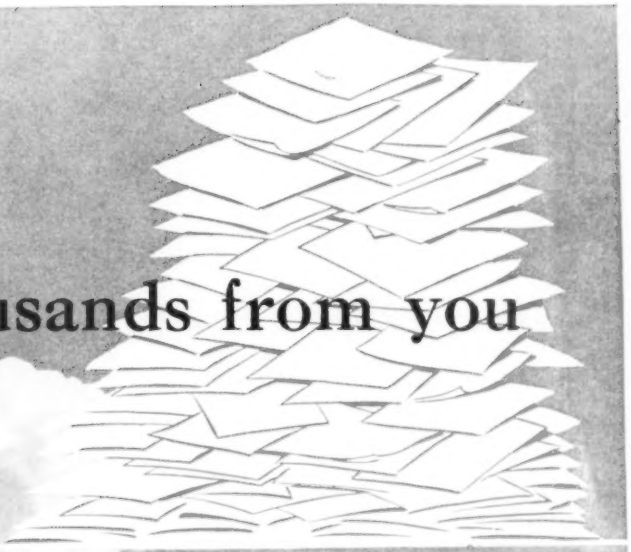
# 10—Boilers, Heaters, Exchangers, Coolers

IN the over-all processing arrangement there are a large number of different kinds of heat-transfer equipment. Each is of the most modern design and constructed to adequately handle the high pressures involved. Here is shown a view of one section of such equipment: (Left to right) three 2,000-bbl. raw-water-storage tanks, boiler blowdown, zeolite-salt storage and feeding house, boilers 1 and 2, boiler pump house, and the direct-fired furnaces. Details of the equipment are shown on next page.



# one letter...

# to answer thousands from you



**asking about the new postwar line of Cessnas**

Ever since we interrupted our program of manufacturing private airplanes to turn out military aircraft, during these war years, we have received thousands of letters asking, "What are the new postwar Cessnas going to be like?"

Today, we can tell you. And the simplest answer is this:—

From thousands of letters and interviews during the past four years we believe that we know now what features you want most and can use best in the airplane you buy.

Here they are:—

1. Safety 2. Speed 3. Performance 4. Comfort 5. Economy 6. Minimum Maintenance

As a result we have deliberately combined all of these features into a completely new line of high-wing, metal airplanes, equipped with a new, patented landing gear, in a wide range of speeds and prices.

Prewar, we built the famous Cessna Airmaster, three times judged the world's most efficient airplane in open, international competition.

Postwar, we intend to give you even greater speed and performance plus an all-time high in safety, comfort and economy.

You'll notice that our signature reads "Cessna, the Pilot's Airplane." We say that advisedly because we believe that a pilot's airplane is safe, fast, easy-to-fly . . and not a "hot," hard-to-fly airplane.

If you are a pilot now you want a pilot's airplane as all statements from pilots indicate. If you are not a pilot now, you will be when you start flying. Then, you, too, will want a pilot's airplane. So why not point your thinking in that direction now.

Since we built the last Airmaster we have gained a wealth of knowledge and experience in precision manufacturing and engineering on our war program.

Tomorrow, in one of the most modern, efficient and wholly-owned aircraft plants in the world, we will add that new precision experience to our 34-year background in aviation to produce the airplane that we sincerely believe you want most and can use best.

* * *

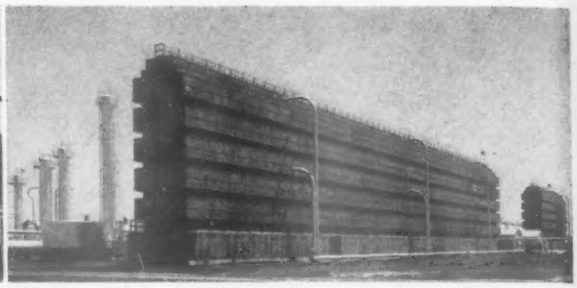
This is the first of a series of messages that will give you complete information about the new, postwar line of Cessnas.

Cessna

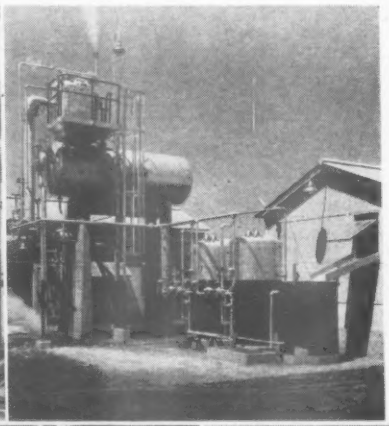
THE PILOT'S AIRPLANE



XUM

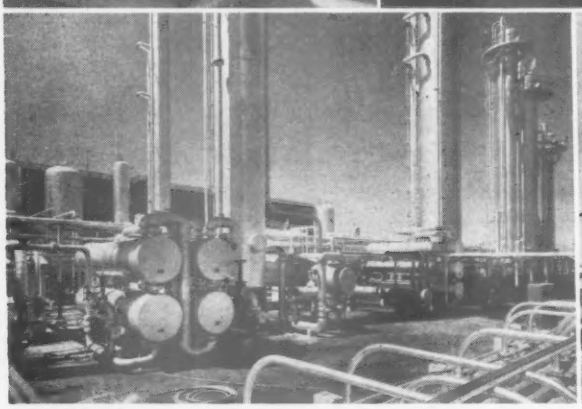


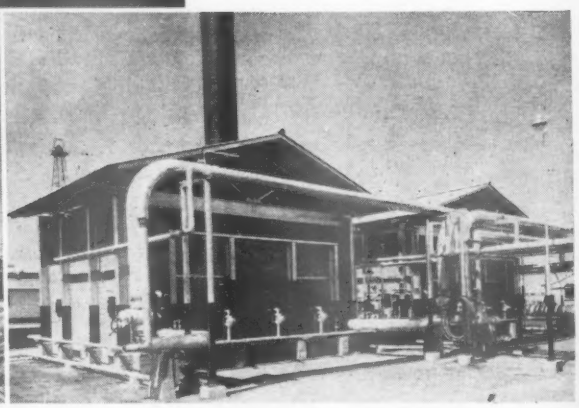
*Left: Furnaces at left; the two 540-hp. three-drum water-tube boilers are at right, where induced-draft turbine-driven blowers help provide efficient combustion. Right: The cooling tower for plant processing operations in foreground has 52 sections, is 320 ft. long by 55 ft. high. The tower to right is for jacket-water cooling, has 20 sections and is 160 by 55 ft. Total water pumped to the tower is 12,500 g.p.m. All coolers and condensers are open type, mounted in the bottom of the towers*



*Extreme left: Direct-fired unit, 500,000-B.t.u.-per-hour lean-oil reboiler on the reclaimer unit. Setting is adjacent to the two direct-fired furnaces shown below*

*Left: Feed-water heater is at left; water-treating equipment, using sodium zeolite ion exchange, in center. Note slide for introducing salt to brine tank from storage house at right*

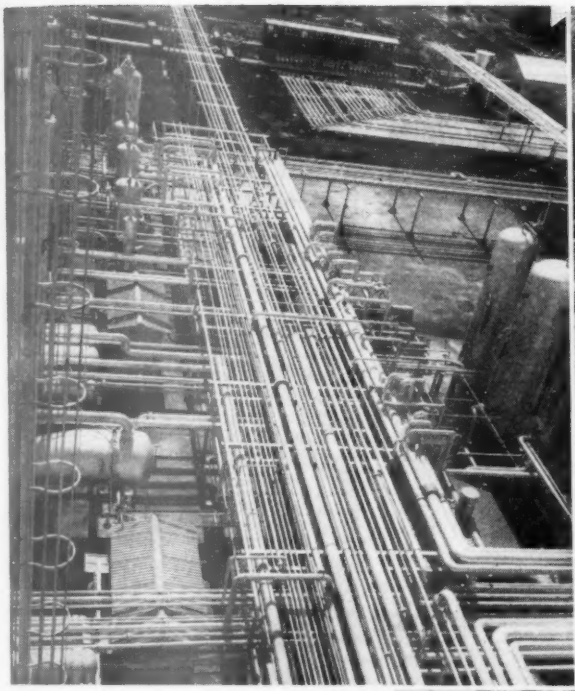


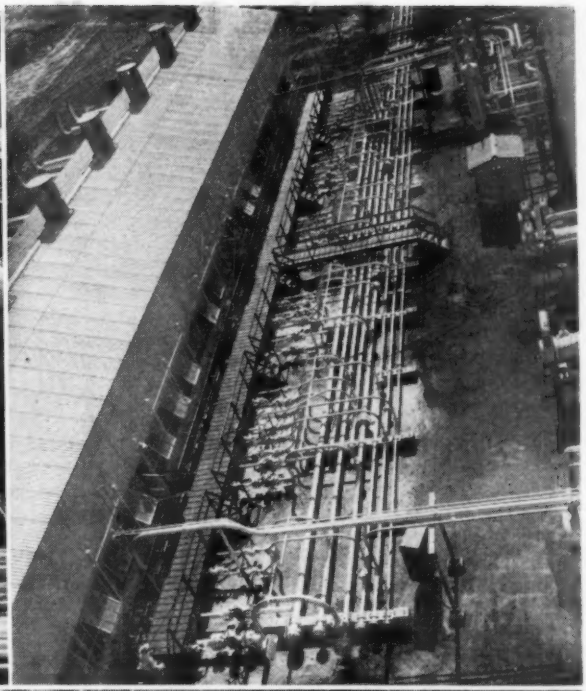


*Left: Four lean oil-rich oil heat exchangers are in foreground; then to right is the depropanizer and its reboiler. Further to the right are the condensate debutanizer exchangers. Right: Two direct-fired 15,000,000-B.t.u.-per-hour furnaces. The left one heats the charge to the high-pressure stripper, the right one the feed to the raw condensate debutanizer*

# 11—Transfer Lines and High-Pressure Piping

*Aerial view of lines connecting to field, and showing one of the expansion loops. Paloma is near Buena Vista Lake, now confined by dikes for agricultural purposes. The plant is on a high part of the old lake bed. A dike separates the low and high areas, but for precaution against possibility of flooding, a levee (foreground) was built around the plant and storage farm. Foundations for the plant equipment were sunk 10 to 15 ft. through the old lake bed to secure adequate bearing*

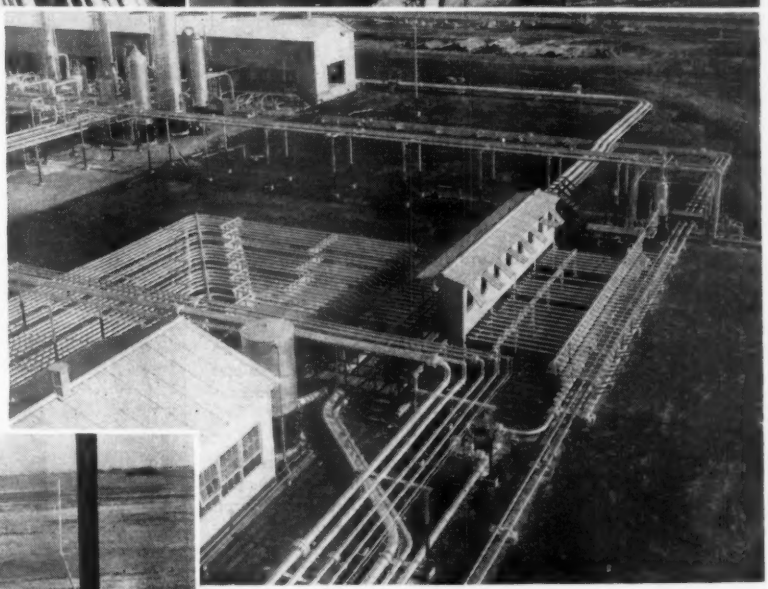




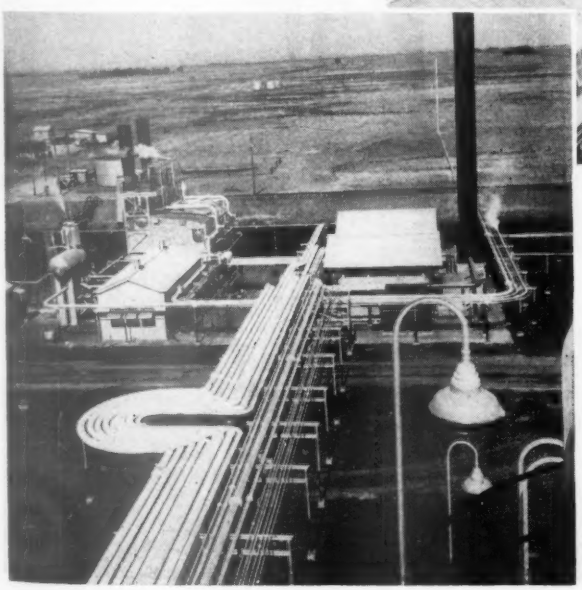
# 11—Transfer Lines and High-Pressure Piping (Continued)

*Above:* Overhead piping in the column area

*Above, right:* Pressure headers adjacent to the compressor plant. Excess liquid propane is pumped into the 4,500-psi. line with the dry gas, for return to the producing formation



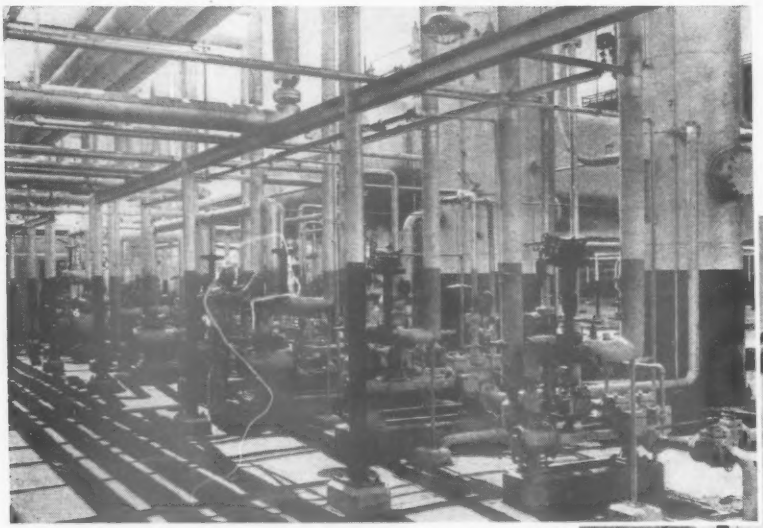
*Aerial view of incoming insulated condensate lines and outgoing dry lines to the input wells, together with manifolds, meter house (center), and test separator*

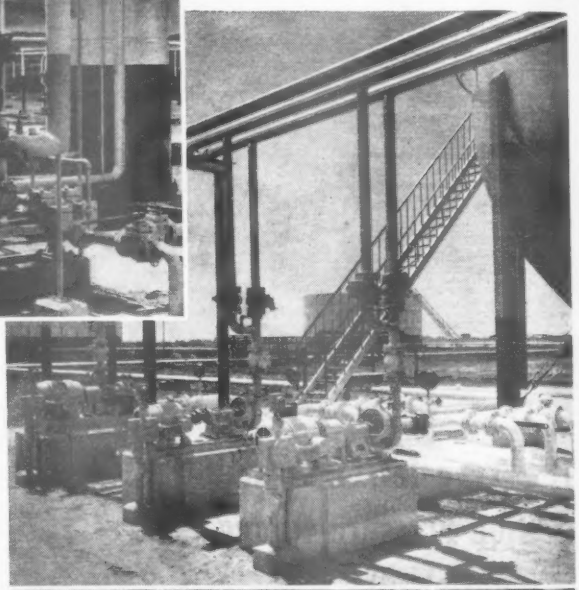


*Piping and loops to and from the boilers and fired heaters. Photos Part 3 courtesy C F Braun & Co.*

# 12—Pumps, Turbines, Engines, Motors, Fluid Transfer Equipment

UNDER this heading the engineering and equipment involved in transferring, charging, and transporting the raw and processed materials through the plant are illustrated. Some pumps used are reciprocating, others are centrifugal. Both multicylinder gas engines and steam turbines are employed.



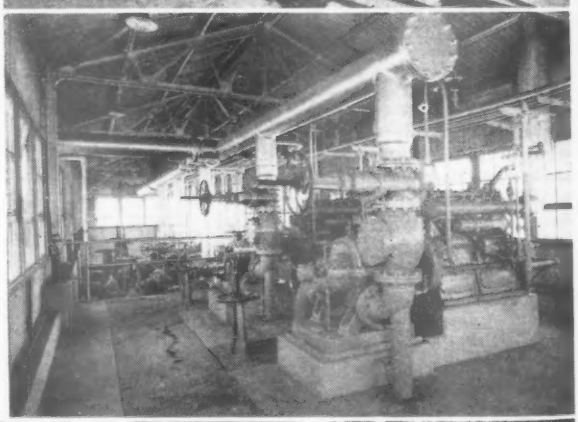


*Above: Here are eight of the many pump units, all in feed, reflux, and product transfer service. These are all steam-powered, controlled by motor-diaphragm valves which are actuated from different processing points*

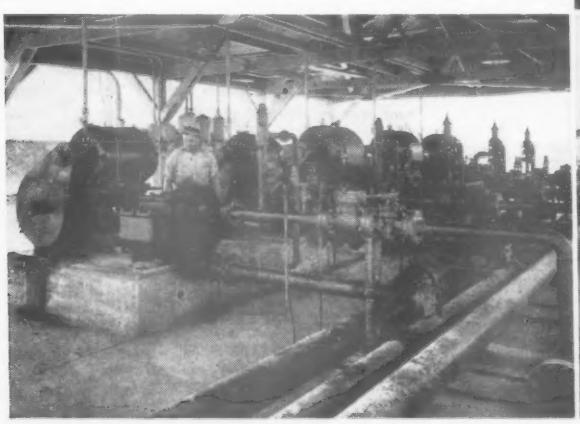
*Right: Natural gasoline and butane from the spherical storage is pumped to the loading rack by these units. The rotary pumps are driven by vapor-proof motors, started and stopped from the central switch rack*

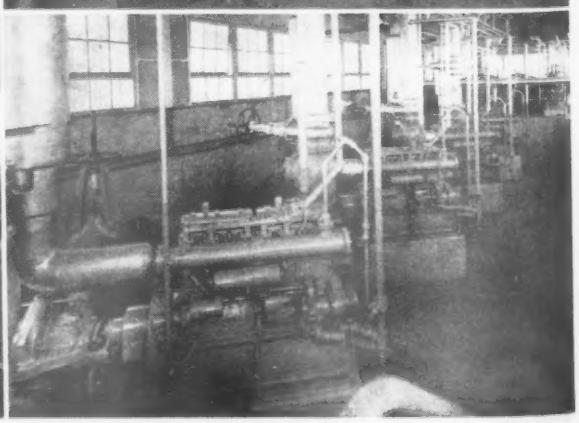
*Right: In another pump house are two jacket-water circulation pumps (foreground) and three tower-circulation pumps*

*Lower right: The process-water pump house has four multicylinder gas engines direct-connected to centrifugal water pumps, and to the rear are three 2,000-psi. lean-oil pumps*



*Below: Pumps in the field pipe-line station of The Texas Co., where crude, condensate and natural gasoline are pumped at 450 psi. to the Emido station of General Petroleum Corp., and on to refineries in the Los Angeles area*





# Distribution of Reserve in Reservoirs

*by Park J. Jones**

PART 2 OF A SERIES

**THE optimum rate of production from reservoirs usually does not exceed the maximum efficient rate of production, the MER. Other things equal, the MER varies with the distribution of reserve in reservoirs. The initial MER depends on the initial distribution of reserve. The MER corresponding to, say, 50 per cent of the initial reserve depends on the distribution of reserve after 50 per cent of the initial reserve is recovered. The MER may vary with time. It depends on the variation with time of reserve distribution. The distribution of reserve in a reservoir at a given time may vary areally and sectionally.**

**Areal and sectional variation of reserve depends on the direction of advancement in reservoirs. The direction of most interest to producers is the one parallel to dip. A decrease of productive area per foot of updip advancement represents areal convergence of reserve. It also represents areal divergence in the downdip direction. A decrease of pay thickness per foot of downdip advancement would represent sectional convergence of reserve. It would also represent sectional divergence for the updip direction. Reservoirs may be classified according to the shape of their productive area as linear or radial. Linear reservoirs have no areal convergence. Radial reservoirs have areal convergence of reserve in the updip direction. Both types of reservoirs usually have a variable pay thickness, that is, sectional convergence of reserve. In radial reservoirs, sectional convergence is commonly in the downdip direction. The effect of areal and sectional convergence on the distribution of reserve is illustrated by examples in this article.**

### Hydrocarbons Initially in Place

THE initial distribution of reserve usually depends on the distribution of the hydrocarbons initially in place. The latter is defined by

$$\frac{S}{a} = 7758hf\,(1 - I) \qquad (1)$$

where

S/a = barrels per acre of hydrocarbons initially in place
h = pay thickness, feet
f = average porosity for h, fraction
I = average interstitial water for hf, fraction of porosity
7758 = constant which converts 1 acre-foot to barrels.

Fig. 2-1 is an illustrative solution of Equation 1. The contours show the thousands of barrels per acre of hydrocarbons initially in place. The oil, condensate or natural gas initially in place is equal to the hydrocarbons initially in place divided by some constant. This constant is called the volume factor for oil, condensate, or natural gas[1-3]. For example, the volume factor for oil may be 1.4; for condensate, 10.0; and for natural gas, 0.8. The first two figures are in barrels of liquid per barrel of hydrocarbons initially in place. The last figure is in M.c.f.'s of gas per barrel of hydrocarbons initially in place. The reserve initially in place is some fraction of the oil, condensate, or natural gas initially in place.

It is advantageous to classify the distribution of initial reserve under the shape and size of reservoirs and under the distribution of pay thickness. The initial distribution of reserve in some reservoirs may also depend on porosity and interstitial water if these be variable. All of these factors may be included either under areal, or under sectional, distribution of reserve.

Reservoirs may be classified according to their shape as linear or radial. But a given reservoir is not necessarily entirely linear or entirely radial. A reservoir may be partly linear and partly radial. The sketches in Fig. 2-2 may be used to illustrate areal distribution of reserve.

Fig. 2-2 (a) illustrates a portion of a reservoir which is linear. In this example, water encroaches undip essentially at right angles to the strike of the oil-water contact. A linear reservoir neither increases nor decreases areally per foot of updip water advancement, or per foot of downdip gas advancement. There is neither areal convergence (decrease) nor areal divergence (increase) of reserve in a linear reservoir. However, if pay thickness increases in the updip direction, there is a sectional divergence of reserve in the updip direction. But if pay thickness decreases in a given direction, there is a sectional convergence of reserve in the said direction.

Radial reservoirs are approximately circular or portions of a circle. Fig. 2-2 (b) illustrates some radial shapes. In radial reservoirs, the length of an oil-water interface decreases as the interface advances updip. This is areal convergence of reserve. Downdip advancement of gas-oil contacts in radial reservoirs is accompanied by areal divergence of reserve. The reserve increases per foot of downdip advancement. Areal convergence, or divergence, of reserve is aside from any variation in

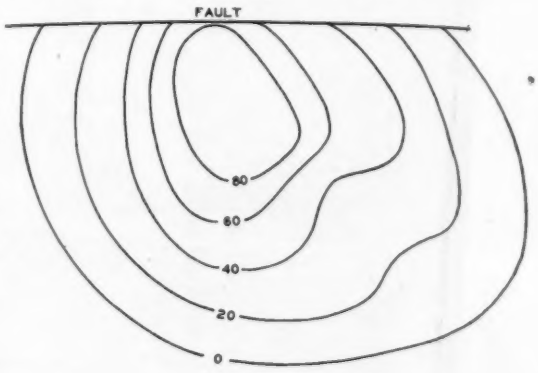
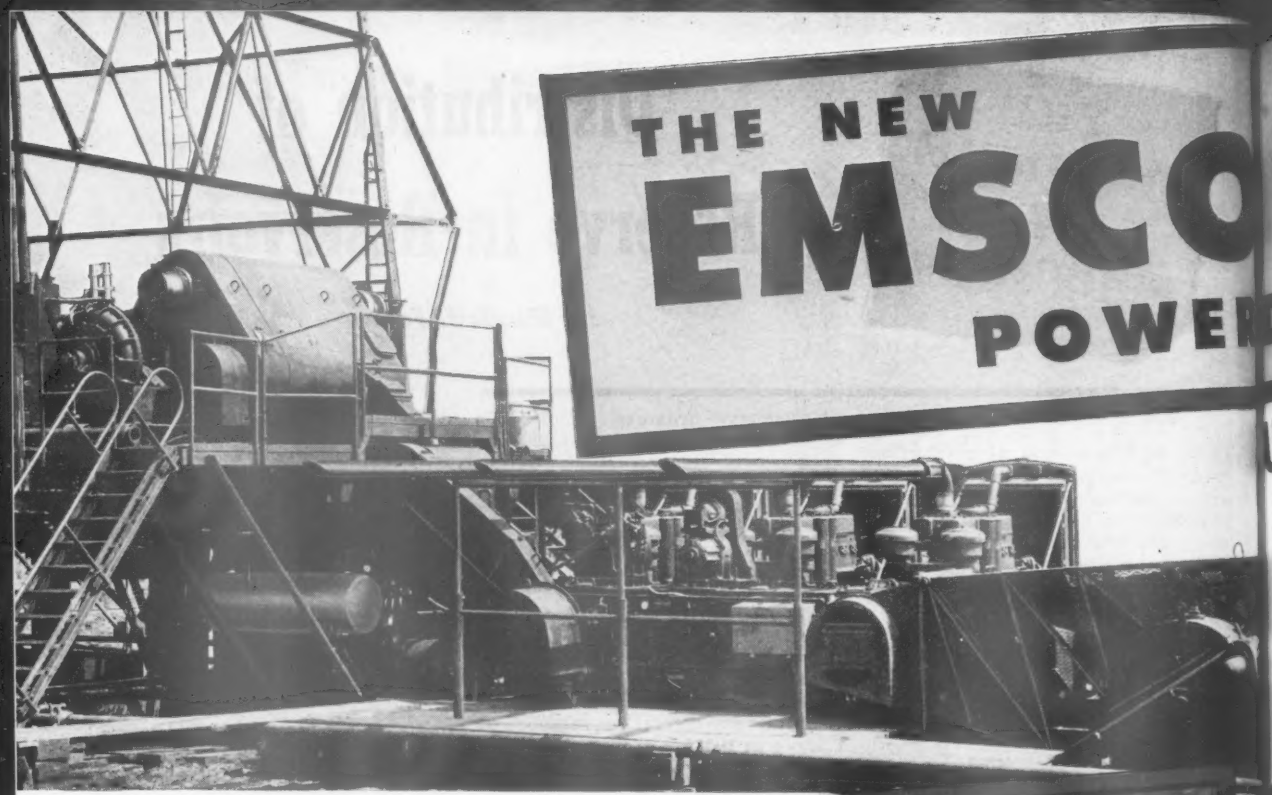
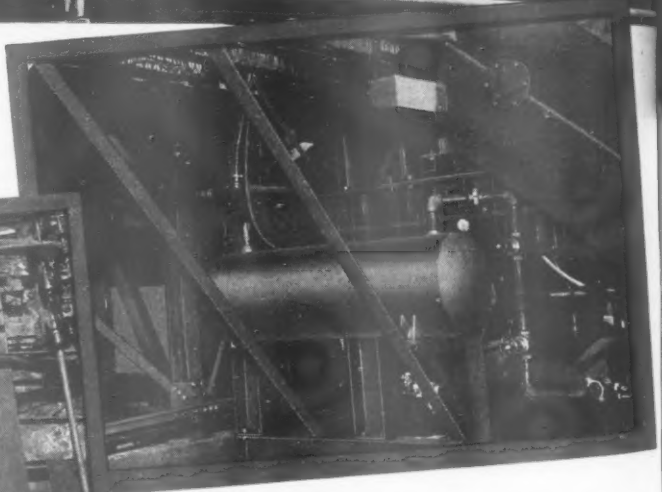



*Fig. 2-1—Illustrating an initial distribution of hydrocarbons in a reservoir*

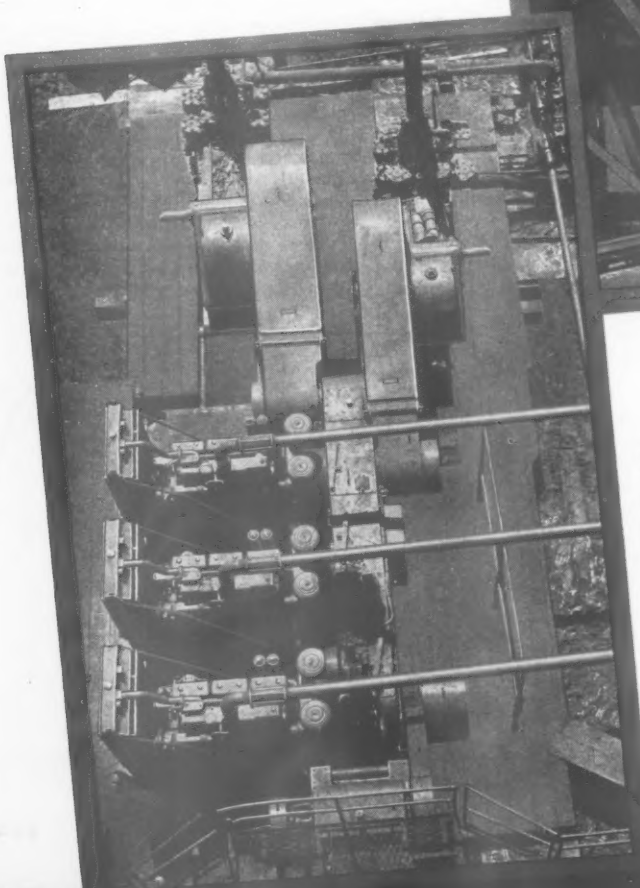
*Production consultant, Houston.




▲ Full view of Emsco J-750 Drilling Unit in position on 10' derrick substructure, illustrating the condensed application of both engine and pump horsepower. *Notice compactness of entire unit.*



▲ Side view illustrating substructure and pressure lubricated stairstep drive from compounding transmission to selective transmission.



▲ View from third derrick girt showing walk-around platform, selective transmission, compounding transmission, pressure lubricated transmission drives and V-belt pump drives. *Notice compactness of entire unit.*

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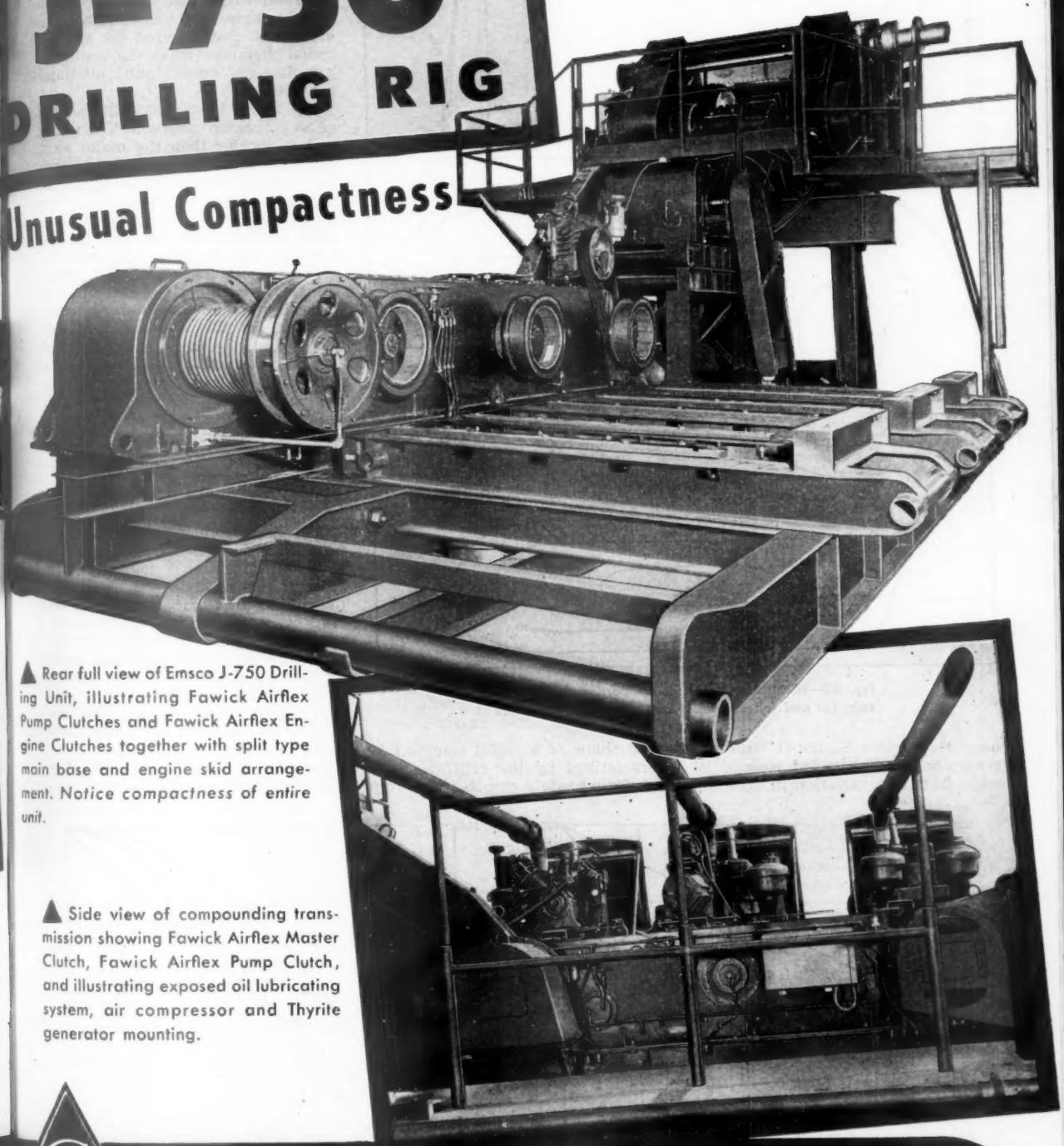
# J-750
## DRILLING RIG

### Unusual Compactness



▲ Rear full view of Emsco J-750 Drilling Unit, illustrating Fawick Airflex Pump Clutches and Fawick Airflex Engine Clutches together with split type main base and engine skid arrangement. *Notice compactness of entire unit.*

▲ Side view of compounding transmission showing Fawick Airflex Master Clutch, Fawick Airflex Pump Clutch, and illustrating exposed oil lubricating system, air compressor and Thyrite generator mounting.

# CONTINENTAL

THE OIL AND GAS INDUSTRIES

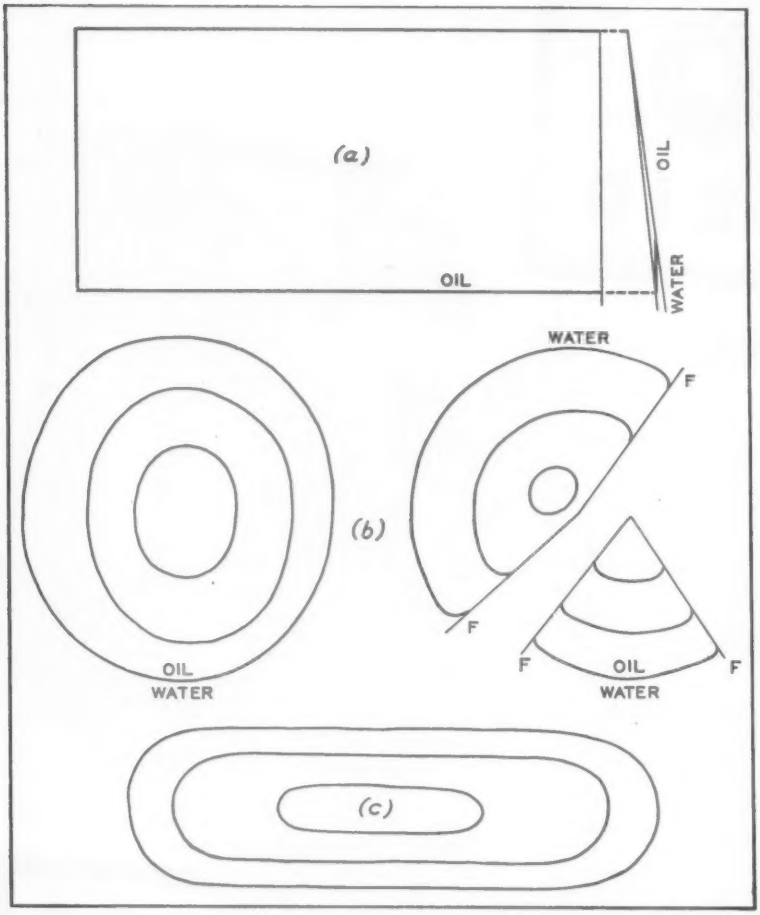



*Fig. 2-2—Illustrating (a) a linear portion of a reservoir; (b) and (c) are radial and elongated reservoirs*

pay thickness. Sectional convergence, or divergence, of reserve is aside from any variation in area.

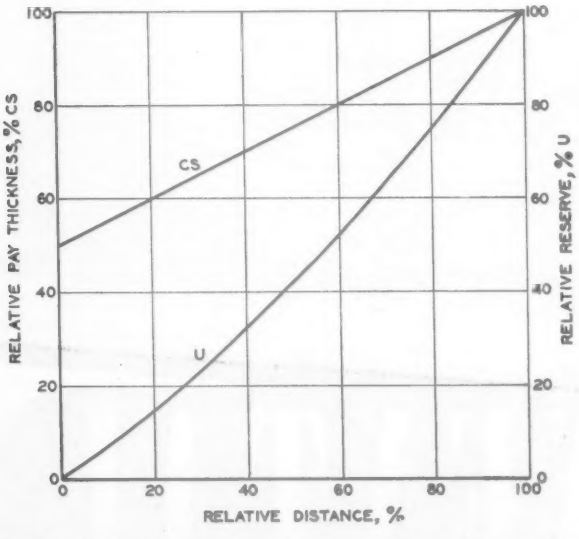
The shape of a radial reservoir is characterized by the central angle. An approximately circular reservoir has a 360° central angle. An approximately semicircular reservoir has a 180° central angle. A graben shaped like a piece of pie is a radial reservoir with a comparatively small central angle. The size of radial reservoirs is characterized by average radial distances from the center to gas-oil, gas-water, and oil-water contacts.

Fig. 2-2 (c) is an illustrative sketch of an elongated reservoir. The minor axis is shorter than the major axis. Elongated reservoirs have areal convergence of reserve in the updip direction and areal divergence of reserve in the downdip direction. Consider an elongated reservoir having a major axis equal to the diameter of a circular reservoir. If other things were equal, the ratio of the reserve in the elongated reservoir to that in the circular reservoir would be the same as the ratio of the minor axis to the major axis. This ratio of minor to major axes characterizes the shape of elongated reservoirs. The size of an elongated reservoir is characterized by the length of its major axis.

### Distribution of Reserve in a Linear Reservoir

The maximum efficient rate of production from a reservoir may depend on the initial distribution of a reserve. But we have just seen that the initial distribution of reserves may vary sectionally and areally. In practice, this variation is obtained by planimetering maps similar to the one shown in Fig. 2-1. In order to illustrate the initial distribution of reserves, we will assume some comparatively simple examples.

Consider a linear reservoir having a twofold increase of pay thickness



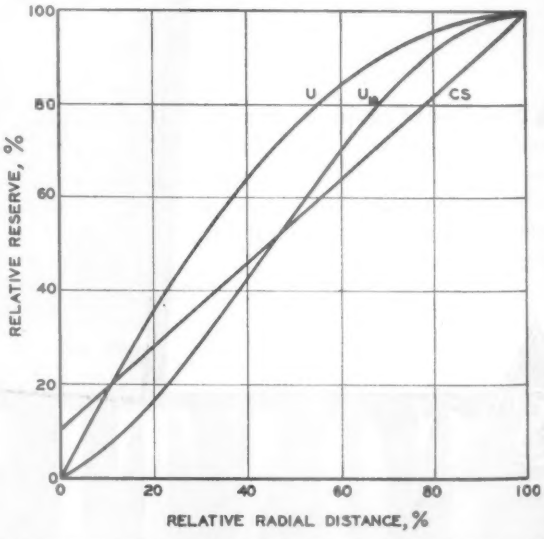




*Fig. 2-3—(Left) Illustrating the relative distribution of reserve U in a linear reservoir having a twofold increase of pay thickness CS.*
*Fig. 2-4—(Right) Illustrating the relative initial distribution of reserve in radial reservoirs; $U_1$ is for uniform pay thickness; $U_{10}$ is for a tenfold increase of pay thickness in the updip direction; the CS line represents relative pay thickness; data are for updip advancement*

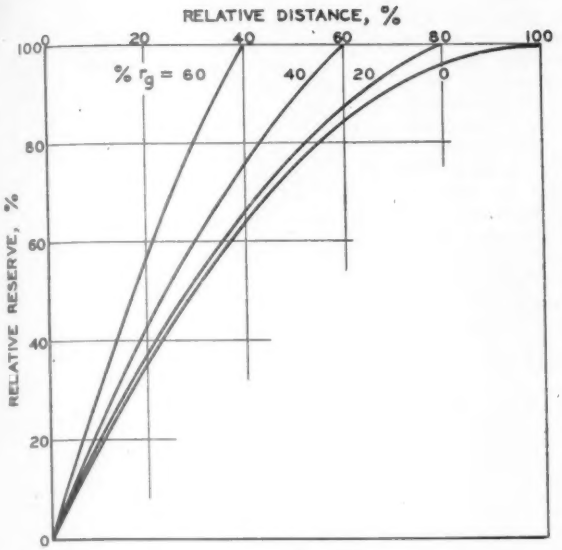



*Fig. 2-5—Illustrating the relative distribution of oil reserve between a primary gas cap and water in radial reservoirs having a uniform pay thickness: $r_g$ is the initial position of a gas-oil contact in per cent of the average radial distance to the initial position of a water contact; the data are for undip advancement*

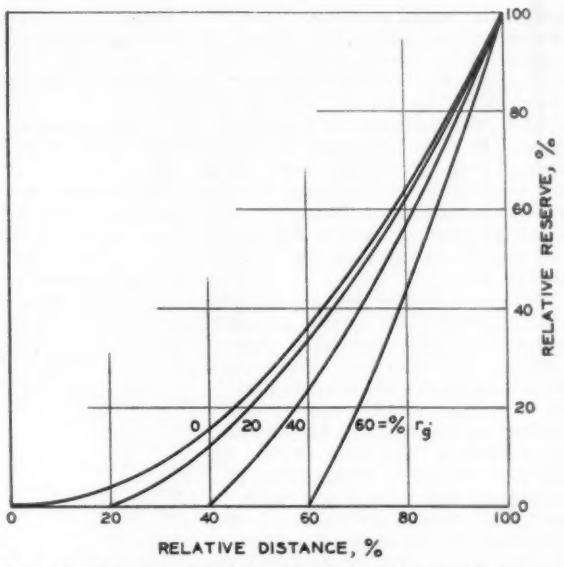



*Fig. 2-6—Illustrating the relative initial distribution of oil reserve between a primary gas cap and water in radial reservoirs having a uniform pay thickness: $r_g$ is the initial position of a gas-oil contact in per cent of the average radial distance to the initial position of a water contact; the data are for downdip advancement*

in the updip direction. In this example, there is no areal convergence or divergence of reserve. But there is a twofold uniform increase of pay thickness. This sectional divergence of reserve is illustrated by the CS line in Fig. 2-3. The relative pay thickness increases linearly from 50 per cent up to 100 per cent in going from the downdip to the updip productive limits. The initial relative distribution of reserve U in this example is defined by

$$U = H(2 + H)/3 \qquad (2)$$

where H is the relative horizontal distance measured from the downdip productive limit. The total reserve is unity or 100 per cent. The lower curve in Fig. 2-3 shows the distribution of the reserve U defined by Equation 2. About 42 per cent of the total reserve is in the downdip half of the reservoir.

### Distribution of Reserve in a Radial Reservoir

Consider a radial reservoir having a uniform pay thickness. Under this condition the initial distribution of reserve U would be given by

$$U_1 = 1 - r^2 \qquad (3)$$

where r is radial distance expressed as a fraction of the average radial distance to the initial oil-water or gas-water contact. The $U_1$ curve in Fig. 2-4 shows the relative initial distribution of reserve for the updip direction in radial reservoirs if the pay thickness were uniform. In this example, 75 per cent of the reserve is in the downdip half of the reservoir.

Radial reservoirs usually have sectional divergence in the updip direction. For illustrative purposes, let there be a uniform tenfold increase of pay thickness. This sectional divergence is illustrated by the CS line in Fig. 2-4. The relative pay thickness is given by $(1 - 0.9r)$ where r is a fraction of the average radial distance to the initial productive limits. The combined effect of areal convergence and sectional divergence on the initial distribution of reserve $U_{10}$ is defined by

$$U_{10} = 1 + 1.5r^3 - 2.5r^2 \qquad (4)$$

The $U_{10}$ curve in Fig. 2-4 illustrates the initial distribution of reserve defined by Equation 4. About 56 per cent of the total initial reserve is in the downdip half of the reservoir in this example.

### Effect of Gas Cap on Distribution of Oil Reserve

The initial distribution of oil reserves may be influenced by primary gas caps. The $U_1$ and $U_{10}$ curves of Fig. 2-4 could represent oil reservoirs having no primary gas cap. Consider now a radial reservoir having a uniform pay thickness in the interval from the updip initial position of water to the downdip initial position of gas. The volume of pay in this example per foot of updip advancement varies only with the areal convergence of reserve. Denote the initial position of an oil-water contact by unity. Let $r_g$ be the initial position of the gas-oil contact. Express this position, $r_g$, as a fraction of the average radial distance to the initial position of the oil-water contact. Then $U_1$ the initial relative distribution of oil reserve is defined by

$$U_1 = \frac{1 - r^2}{1 - r_g^2} \qquad (5)$$

where r is the position in oil pay relative to water and gas, that is, r may have any value between

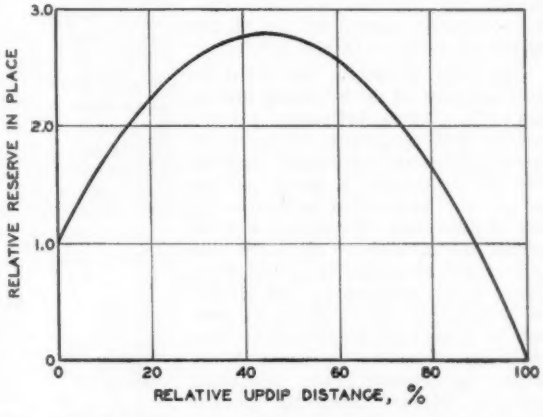



*Fig. 2-7—Illustrating the relative reserve in place per foot of updip advancement in a radial reservoir having a tenfold sectional divergence*

unity, the initial position of the oil-water contact, and $r_s$, the initial position of a gas-oil contact. The curves in Fig. 2-5 are solutions of Equation 5 for 20, 40, and 60 per cent initial positions of gas-oil contacts. In this example anywhere from 75 up to 100 per cent of an oil reserve is concentrated in the downdip half of a reservoir. The curve denoted by zero is for no gas cap and is the same as the $U_1$ curve in Fig. 2-4.

The data in Fig. 2-5 are illustrative examples for updip advancement in radial reservoirs having uniform pay thickness. These same data may be replotted as in Fig. 2-6 to show the relative initial distribution of oil reserve for downdip advancement. The data in this figure are relative to no sectional convergence. But even if we allow for any reasonable increase of pay thickness in the updip direction, oil reserve would still be confined between the initial positions of gas-oil and water-oil contacts. For example, gas-oil contacts averaging 40 to 60 per cent of the average radial distance to water-contacts, would show a concentration of oil reserve near to water which would be similar to that indicated by the 40 and 60 per cent curves in Fig. 2-6.

Gas caps influence the MER for displacement of oil by water and by gas. They also influence oil-producing and operating methods, investment in oil reservoirs, and the cost of producing a given oil reserve. Gas caps also influence the size of an initial oil reserve. For example, the oil reserve for some rim-type reservoirs may be a comparatively small fraction of the oil initially in place. Most of the oil cannot be produced by lowering bottom-hole operating pressure. A decrease of bottom-hole operating pressure either cones up bottom water or else fingers in edge water. Some rim-type oil reservoirs cannot be produced without injecting gas.

### Relative Reserve in Place for Updip Advancement

Up to this point we have been considering the distribution of reserve relative to 100 per cent of the reserve initially in place. We will now illustrate some variations of the reserve in place per foot of updip advancement. Consider first updip advancement in a radial reservoir having no sectional convergence of reserve. Other things equal, the reserve in place varies only with the areal convergence of this example. But this convergence is uniform. Consequently, the reserve in place decreases linearly from some initial value down to zero. Denote the reserve in place per foot of updip advancement from a water contact by 100 per cent. Then the reserve in place per foot of updip advancement decreases linearly from 100 per cent down to zero in going updip from the water contact to the center of a reservoir.

Next consider a radial reservoir having a tenfold sectional divergence in the updip direction. The distribution of reserve for this example is defined by Equation 4. It can be verified from Equation 4 that the variation of reserve per foot of updip advancement relative to the reserve in place within the first foot of updip advancement is given by

$$U = 10r - 9r^2 \qquad (6)$$

where r is a fraction of the average radial distance to the initial productive limits. The reserve in place for the first 1 ft. is assumed to be unity. The reserve in place per foot of updip advancement relative to the reserve in place for the first 1 ft. is shown by the curve in Fig. 2-7. The reserve in place per foot of updip advancement increases for about 45 per cent of the updip distance. In the interval from the initial productive limit up to about 45 per cent of the distance to the center of the reservoir in this example, sectional divergence is greater than areal convergence. So the reserve in place increases. In the interval from about 45 per cent up to the center of the reservoir in this example, areal convergence exceeds sectional divergence. The reserve in place decreases. Graphs similar to the one in Fig. 2-7, for either updip advancement of water or downdip advancement of gas, can be prepared from maps like the one in Fig. 2-1.

### References


1. The Oil and Gas Journal, Jan. 27, 1945, p. 263.
2. The Oil and Gas Journal, Feb. 3, 1945, p. 51.
3. The Oil and Gas Journal, Feb. 10, 1945, p. 99.


**R. B. Block** has been promoted to general drilling superintendent for International Petroleum Co. at Negritos, Peru. He has been assistant drilling superintendent for the past several years, and before that was in Ecuador and Colombia. **L. E. Chisholm,** formerly drilling foreman at Negritos, becomes assistant drilling superintendent.

**Al D. Landry,** newly appointed head of personnel and industrial relations for International Petroleum Co., Talara, Peru, has returned to his office following a 2-month business trip to the United States.

**Ed Parr** has been transferred from the drilling department of International Petroleum Co., Negritos, Peru, to Guayaquil, Ecuador, where he becomes drilling superintendent for International-Ecuadorian Oil Co.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# QUESTIONS on TECHNOLOGY

*by W. L. Nelson*
Consulting Engineer

## Naphthenic Lube Oils Again

**We are informed that lubricating oils made from (naphthenic) crude oil are of very low quality, being very susceptible to heat. We are informed that such oil cracks easily and is worthless in so far as use in present-day commercial engines is concerned.—C.C.J.**

Competent technical experts on lubricating oil cannot make such definite statements about any oil or even about the general types of oils. They are unable to make such statements because each of the types of oils has certain superior properties as well as certain disadvantages and at the best we can only compromise between these extremes in producing a lubricating oil. Most lubrication engineers and refinery chemists are now agreed that the main requirements of a good engine oil are:

1. **Detergency** in which the naphthenic oils excel.

2. **Viscosity index** in which the paraffin oils excel.

Detergency stands first in importance because it keeps the engine clean and viscosity index is secondary because it affects only ease of starting. About the only way to get a combination of these properties is to use a paraffin-base oil to which is added a detergency additive, or to use a naphthene-base oil which has been solvent refined to improve its viscosity index and then to add a detergency additive if that be necessary. More practically, the industry has for years blended naphthenic neutral (light) oils with paraffinic bright stocks (thick) oils in the ratio of about 2 to 1. This gives a reasonably good viscosity index so that "starting" can be accomplished at somewhat low climatic temperatures and imparts enough in the way of detergent properties to make an oil that will not cause serious carbon formation in the engine. Between one-third and one-half of all oils manufactured in the United States have been of naphthenic-base origin. Additives can be used to improve the viscosity index of the naphthene-base oils but they have not been widely used.

At one time technical men attached great significance to the darkening or blackening of an oil during service. The true significance of color and even sludge formation is now not at all clear because we have learned that darkening occurs almost immediately with good detergency oils. Thus, there is some reason to believe that an oil should carry or suspend carbon particles and engine debris as do the detergency oils rather than to constantly thicken in the engine, as do paraffin-base oils and many straight solvent refined oils, until a hard carbon scale occurs on the engine mechanism. In diesel engines the tendency of the paraffinic oils to produce carbon is so serious that they cannot be used unless a detergency additive is put in them whereas some naphthenic-base oils have performed satisfactorily in diesel engines without the use of a detergency additive.

The relatively low boiling range (and flash point) of naphthenic oils causes a slightly larger oil consumption, probably not in excess of 5 per cent (see The Oil and Gas Journal, page 73, February 17, 1944). The poor viscosity index of most straight naphthenic oils causes difficulty with starting at low temperatures but this serious trouble can be alleviated to some extent by the use of very thin or nonviscous oils during extremely cold weather provided they do not become so thin at engine temperatures that they fail to lubricate the engine. Table 1 indicates the lowest "easy-starting" temperatures of oils of various viscosity index. It is obvious that S.A.E. 10W or 20W oils of any base are satisfactory.

Our confusion about lubricating oils is not new. It has been discussed frequently on these pages:

1. V.I. versus Detergency — Feb. 20, 1941, pg. 63.

2. Significance of Neutron Number, Nov. 21, 1940, page 53.

3. Carbon Residue Tests, Jan. 11, 1940, page 43.

4. Significance of Viscosity, Nov. 23, 1939, page 46.

5. Flash Test, Sept. 1, 1938, page 42.

6. Consumption of Engine Oil, Sept. 17, 1944, pg. 73.

7. Naphthenic Crude Oils, Oct. 14, 1944, pg. 113.

**TABLE 1—LOWEST EASY STARTING TEMPERATURES* FOR OILS, °F.**
(40,000 Seconds Universal Saybolt viscosity causes difficulty in starting.)

| | Viscosity index | | | |
|---|---|---|---|---|
| | Zero | 40 | 60 | 100 |
| 40 Viscosity @ 210°F. | —14°F. | —23°F. | —25°F. | —34°F. |
| S.A.E. 10W | —17 to —26 | —18 to —27 | —19 to —29 | —20 to —30 |
| S.A.E. 20W | 0 to —17 | 0 to —18 | 0 to —19 | 0 to —20 |
| S.A.E. 10 (Thinnest) | —2 | —9 | —13 | —20 |
| S.A.E. 20 (Thinnest) | 5 | —2 | —6 | —12 |
| S.A.E. 30 (Thinnest) | 22 | 13 | 9 | 0 |

*Pour points should also be below the easy starting temperature.

## Pressure Compressibility Of Kerosene

**We desire a table or graph of the compressibility of liquid kerosene through the pressure range of 110-1,000 psig. and temperature range of 40°-100° F. We will appreciate any information you can give or any references as to published literature.—J. L. W.**

Data on the change of density caused by pressure (and temperature) have been published by Egloff, Nelson, Watson, et al in The Oil and Gas Journal of July 2, 1936, (page 34); by K. M. Watson, Ind. Eng. Chem. 35, 398 (1943), and by Gamson & Watson in the May 3, 1944, Technical Section of National Petroleum News. Only a limited amount of experimental data is available but a general relationship employing the Theorem of Corresponding States has been developed by these men by which reasonably accurate estimates can be made. The computation of a complete table or chart is beyond the scope of this page, but several approximate values computed from the above data are tabulated below. The compressibilities are expressed as the fractional change in volume per pound per square inch in the pressure range of 14.7 to 1,000 psia.

**PRESSURE COMPRESSIBILITY OF KEROSENE**

| | |
|---|---|
| 60° F. | 0.0000084 |
| 100° F. | 0.0000097 |
| 184° F. | 0.0000192 |

The data of D. L. Katz in The Oil and Gas Journal of November 12, 1942 (page 179), on crude oils appears to give smaller compressibilities than the above references. The same data are published by Standing & Katz on page 159 of the 1942 Transactions (Petroleum Technology) of the American Institute of Mining & Metallurgical Engineers in a paper entitled, "Density of Crude Oils Saturated With Natural Gas."

# Directional Drilling Used as Exploratory Tool in Gulf Coast Well

*by E. H. Short, Jr.*

**This article describes a recent application of directional drilling as a means of subsurface exploration. Although the productive horizon sought was penetrated on the second attempt, this particular case illustrates the possibilities in this type of work.**

PERHAPS no other operational technique in the oil industry has continued to advance more rapidly than directional drilling. Just when it appears that its possibilities have been fully exploited, the successful completion of another well (under unprecedented requirements as to the ultimate objective, speed and accuracy) advances the technique to a still higher degree of versatility. From a relatively crude guess-and-hope operation, it has successfully emerged, during the past 5 or 6 years, from a maze of seemingly impossible assignments to become one of the most accurate of engineering operations. Modern directional-drill-

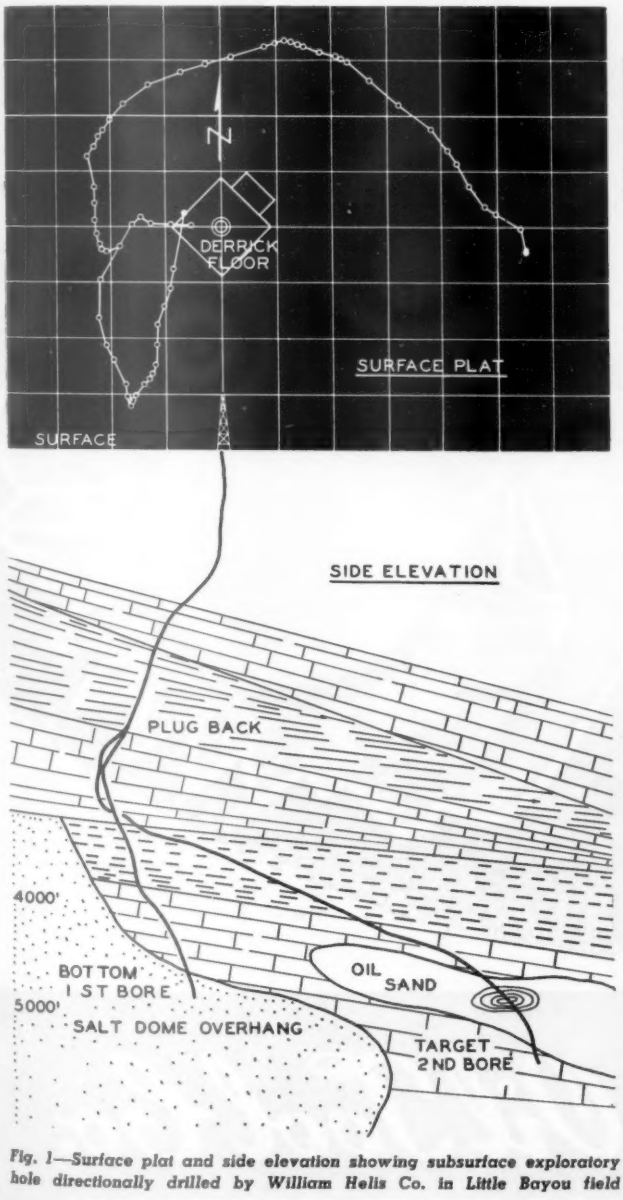


*Fig. 1—Surface plat and side elevation showing subsurface exploratory hole directionally drilled by William Helis Co. in Little Bayou field*

*Fig. 2—The spud bit (when fully made up on the drill collar) is pointed a fixed number of degrees from the north pole of a magnetic arrangement in the orienting sub above. This difference is measured before running in the hole, and, when compared simultaneously with the direction of a subsurface compass, orientation is easily accomplished. This bit is smaller than the outside diameter of the well bore, but due to its eccentricity in action, drills a full-gage hole*

*Fig. 3—(Left) The nonmagnetic K monel metal drill collar eliminated the necessity of removing the drill pipe and conventional bit from the hole when check runs were necessary. The collar, attached just above the bit, allows the single shot to obtain an accurate reading without magnetic interference of its compass*



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ing technique, which enables operators to place the bottom of several tons of drill pipe on a small unseen target 3 miles below the surface of the earth, is an accomplishment which ranks in the same field of scientific marvels as the present-day gunnery methods which enable warships to accurately direct a ton or more of steel to an unseen enemy ship some 30 miles away.

In the drilling of the Seminole (Oklahoma) field during the late twenties, unintentional directional drilling was responsible for many geologic nightmares. In many instances dry holes were encountered only one location away from prolific producers, and in still other cases, the Wilcox sand appeared to make precipitous drops amounting to 500 ft., from one well to another. This simply was not in accordance with known precepts concerning this formation. When the first acid bottle surveys showed Seminole holes to be extremely crooked, the Wilcox was exonerated and many contractors and oil companies had to learn how to drill a vertical hole.

During the past few years directional drilling has progressed to the point where the bit can be caused to wander or deviate as greatly as it did during the early days of Seminole, but now under the charted control of the operator. Directional drilling technique as a means of drilling several wells from one location; for side-tracking lost tools; for drilling from land locations to specified points under the ocean floor; for bringing blowouts under control; and drilling around the overhang of salt domes, are now common operations.

Directional drilling as a means of subsurface exploration is perhaps the latest addition to the already versatile list. Recently the William Helis Co. planned a program which involved punching multiple bore holes from one location to various targets under the lease. Although the productive horizon sought was penetrated on the second attempt, this particular case illustrates the possibilities in this type of work.

The William Helis well was drilled in the prolific New Iberia field, Iberia Parish, Louisiana, where many thousands of barrels of oil have been produced from multiple underlying sands. Generally, the geology has been determined but more than once certain sands have been missed, although already producing in offset wells.

Fig. 1 shows the surface plat of both the plugged original hole and the final directionally drilled hole, and illustrates the accuracy with which the course pierced the target. Below this, greatly magnified and out of proportion, is shown the side elevation drawing of the course of the bore hole, first to the salt dome overhang below the derrick floor, and then to the oil sand target.

The well was drilled straight to a depth of 867 ft., and at this point the hole began to wander out of control until at a depth of 3,552 ft., the first setting of the spud bit was made in an effort to bring the course back to a position directly under the derrick floor. At this point, it should be mentioned that the Homco spud bit (Fig. 2), used in drilling this well, operates on the principle of an eccentric. After spudding a shoulder with the bit faced in the direction of the desired hole deflection, rotation causes the bit to drill a deflected hole. Although this bit is smaller than the hole in which it is used, the eccentric action drills a full-gage hole.

After drilling a few feet with this bit it was easily reoriented while on bottom. In the soft to medium hard shales the drilling was controlled with no difficulty. In performing this operation it was necessary to run the tool twice, once at 3,852 ft. and then again at 4,031 ft. The hole was bottomed in salt at 4,783 ft.

### Second Exploratory Course

In the second exploratory course, the hole was plugged back to 2,519 ft. at which point side-tracking operations were begun with the first setting of the spud bit. After drilling 103 ft., or to a depth of 2,622 ft., the spud bit was again reoriented. The course of the hole was not pointed directly at the 10 by 20 ft. target at 4,900 ft., but a rather indirect path was chosen. This choice was based on the possibility of obtaining aid from the formation in bit control drilling and also because of the need for establishing adequate course length, which in turn would permit the proper angle of inclination. After resetting the tool at 2,661 ft. it was replaced with the conventional four-way drag bit and a resurvey was made after drilling 30 ft. In order to hit the target on the selected course, it was calculated that an average angle of inclination of approximately 6° would be needed. This angle of inclination varied, but the accuracy of control is brought out by the fact that the bore hole hit the target.

In the drilling of this well the spud bit and magnetic sub for bottom-hole orientation were used simultaneously, and these tools were largely responsible for the speed and over-all success of this particular directional drilling assignment. The procedure on this well was to determine the direction of the cutting point of the drilling bit before beginning operations. While this may be done by orienting it in with each joint of drill pipe, on this well the tool was run to bottom without regard to its direction, and then oriented. This latter method involved only the addition of an orienting sub (containing a magnet arrangement) above the tool.

The combination of bottom-hole orientation and the spud bit allowed easy orientation of the tool. However, when replacing the directional tool with a conventional bit, a nonmagnetic (K Monel) drill collar replaced the orienting sub in the drill string. This arrangement permitted the running of the single shot to check the direction and inclination of the hole without removing the bit and drill pipe. In other words, the time and expense of pulling the bit from the hole in order to check its course was saved each time tool runs were found to be unnecessary by the survey.

The success of the bit control method employed in the directional drilling of this well is best indicated by the fact that it was necessary to run the directional tool only five times during the complete drilling procedure of the final hole. During this job when greater inclination was needed, the drill collar assembly was shortened and drilling operations conducted with more weight upon the bit. If less inclination were desired, the drill collar assembly was increased to a length slightly greater than 60 ft. and less weight was carried on the bit.

In the first case, the drill pipe tended to bend and in the second case, it was stiffened and had a tendency to run straight. During the final stages of drilling, the inclination of the hole reached an angle of almost 10° which would have thrown the course off the target. While approximately 500 ft. above the target, the drag bit was replaced with a rock bit and the drill collar assembly lengthened. After the installation of this equipment, the angle of inclination dropped steadily from approximately 10° to approximately 1°, at the point where drilling operations were stopped in the pay section.

# BOOKS

**DIESEL FACTS.** Published by Diesel Engine Manufacturers Association, 1 North LaSalle Street, Chicago. 12 pp.

Growing demand for diesel engines for producing the power in municipally owned power plants is revealed in this new booklet, the first of a series to be issued by the association. Prior to 1910, comparatively few diesels were used to generate current for municipally owned power plants. By 1943 nearly 2,000,000,000 kw.-hr. were being generated by diesel engines in such plants. A special section of the booklet treats of the procedure to be followed by a city that wants to have its own power plant. Future booklets to be issued will deal with diesel-engine applications in ships and boats, locomotives, the oil industry, and various stationary usages.



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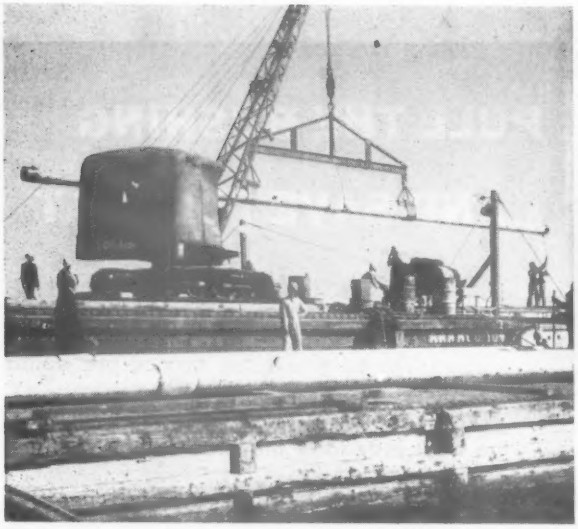


*Left: Drag line lifting double-jointed coated section from lighter to narrow-gage railway. Right: Covering bare ends of joints after welding*

# Special Methods Employed in Laying Submarine Pipe Line in Arabia

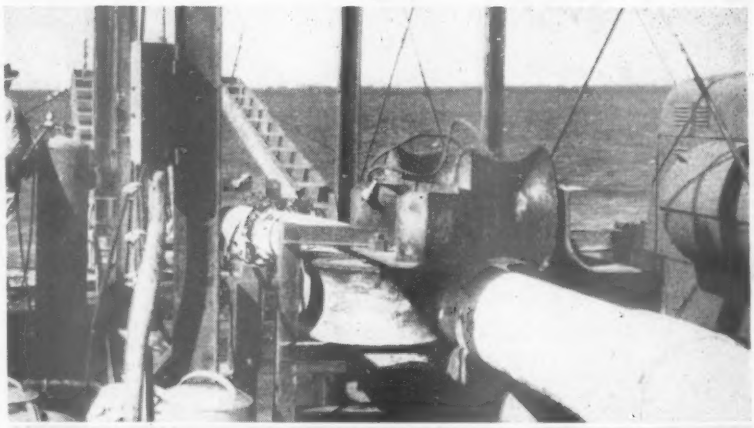
***by Paul Reed***

FOR transporting crude oil from the Damman field, Saudi Arabia, to the island refinery of The Bahrein Petroleum Co., Ltd., Arabian American Oil Co. has laid a 34-mile line. Seventeen miles of the 12-in. is a submarine line laid across the strait between Bahrein Island and the mainland, subject to storms and tidal movements of the Persian Gulf where the temperature and salt content of the water is unusually high.

Problems were solved by engineers of Standard Oil Co. of California which owns 50 per cent of the Arabian American and Bahrein companies. The contractor was Bechtel-McCone Corp.

Sharp coral formations threatened to damage the pipe at seven reefs separated by deep channels crossed by the submarine line. At points where edges of reefs rose abruptly, divers installed concrete supports. Lateral supports had to be provided to keep the pipe in position so that it would not be moved by the strong tidal currents. The greatest depth of the submarine line was 50 ft.

Piles were driven at intervals of 1,000 ft. along the route. These were



*Right, top: Launching pipe through rubber-covered rollers. Right, bottom: Barge with special cranes and drag line for submarine pipe laying*

used for holding cables in mooring the pipe laying barge so that it could be moved forward and aft by deck winches. Lateral movement was controlled by cables anchored to the bottom.

In the lowering process pipe was supported in accordance with customary practice.

The pipe laying barge, 180 ft. long and 40 ft. wide, had a narrow gage railway along the center line, an overhead monorail crane, a drag line, power-driven winches to handle the cables, diesel-driven electric generator, water system, compressed air, asphalt kettle, a cook house and mess hall. In addition, eight smaller barges were built for the project.

Two-joint sections of pipe coated with Somastic in the United States by Industrial Engineering Co. were lightered to the laying barge where they were picked up by the drag line and placed on cars on barge railway and these were added to the line by welding. Welds were covered with Somastic. Pipe was fed over the stern on rubber-coated rollers for protection of the coating against damage.

A smaller barge had similar rubber rollers on outriggers for supporting the pipe astern while it was being lowered.

Storms and high seas interrupted the work. When the anchor dragged so that the pipe was bent it was necessary to have a diver cut out a section with a torch at a depth of 35 ft. Seas often broke over the barge. There was some seasickness. Night shifts operated under flood lights.

Laying began in December 1944 and was completed in 91 days, of which only 65 were working days. On February 28, a hydrostatic test of 1,200 lb. was applied. Oil shipments reached Bahrein Island on March 3.

Cathodic protection equipment was installed on each shore as a further precaution to safeguard against corrosion in case the coating might be injured at any point.

In addition to the 17-mile submarine line, the entire 34-mile, 12-in. pipe-line project includes 10.6 miles across Bahrein Island and 1.6 miles in Saudi Arabia.

The 17-mile submarine line is the second longest under-water Somastic coated line; the longest is the 24-mile, 14-in. line across Lake Ponchartrain, Louisiana.

**C. R. Clark,** formerly of Ada, Okla., has joined the geological staff of Kerlyn Oil Co. in Oklahoma City.

**L. A. Burkett,** production foreman for International Petroleum Co., Negritos, Peru, and Jack Donovan, drilling foreman, are vacationing in the United States.

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# Plant Practices

## Welding Positioner

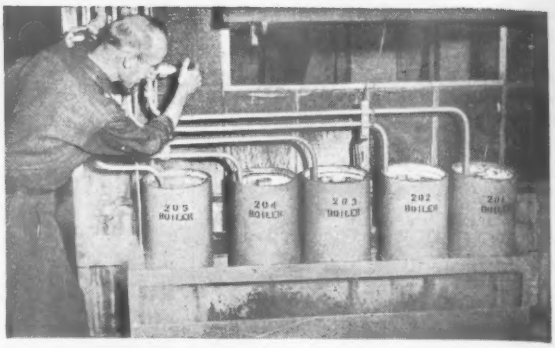
FOR ease in welding the large variety of work to be done, a Ransome positioner was purchased, without a power drive. A pneumatic motor of an older type, too badly worn for use as a tool, was set up on a bracket and used for the power drive. By setting the valve on the air motor, its speed is controlled from the maximum down to a creep. For operation, a foot valve, in addition, is used. By this combination the operator can inch the work around in short steps or run it slowly and continuously, stopping as required

to change electrodes. For mounting the work on the turntable, an 18-in., four-jawed chuck was bolted to the face plate, which will hold a large variety of work such as pipe, valves, etc. For work such as that in the picture of the piston head, a short rod or mandrel is held in the chuck. The piston head is slipped over this mandrel and is ready for work. The positioner is grounded to one side of the welding circuit so no ground clamps are required when setting up work for welding. All welders have reversing switches so it is not necessary to change leads if it is desired to reverse the current polarity. This positioner will handle articles of any size if the weight is not great enough to overbalance the machine. It also can be swung down so face plate rotates on a horizontal axis and used for rotating lengths of pipe, the other end being supported on outboard rollers.

## Continuous Blowdown Installation

THE refinery operates its own steam and electric power with boilers of 100,000 lb. per hour rating at 650-lb. pressure. These operate continuously for 6 months between cleaning and with an 85-90 per cent of raw makeup water. This water with the chemicals added for treatment to prevent scale formation, would soon result in too high a soluble content in the boiler water. To control this, a continuous blowdown is operated on each boiler which takes a continuous stream from the water in the upper or steam release drum. This stream of hot water is reduced in temperature by passing through a cooler where the heat is picked up by cold water on the way to the feed-water heater.

The analyses of the boiler water are made every 8 hours. The control is by volume of blowdown and by the quantity of chemical feed. The latter is controlled by a time clock which operates the chemical feed pump



so many minutes every hour. The blowdown quantity is indicated by use of the pots shown in photograph.

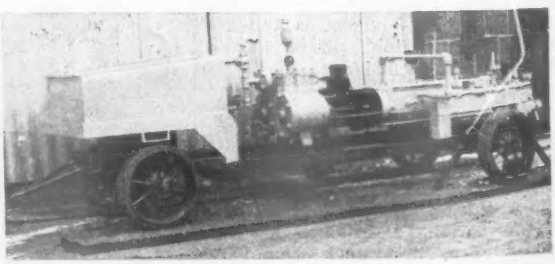
A ½-in. line delivers the blowdown water to a pot made of a short section of 12-in. pipe. In the bottom is a ⅝-in. diameter orifice through which the water is drained by gravity. The quantity drained depends upon the static head, or how full the pot is of water, the depth of water being read on a scale inside the pot. Thus, the operator sets his blowdown valve to hold the water level in the pot to a fixed level, height of which is indicated by the water analysis. The small pipe seen in the center of the pot is an overflow.

By this means, the operating engineer can always maintain a constant setting of his blowdown, and can change it accurately, thus giving a close control of the water in the boilers.

A source of trouble has been the blowdown valve, which the operator is seen adjusting in the photograph. This controls the volume flow and has to stand a pressure drop from 650 lb. to atmospheric. At this differential the cutting action of hot water is very severe on the seats of the throttling valve. No material was found on the market which would withstand this cutting action. As a last resort cemented carbide seats were tried, the first being put in 7 years ago and is still in service without a mark. The remainder of valves were so trimmed. This device was developed by John Searl, assistant power engineer.

## Portable Test Pump

FOR hydrostatically testing vessels and boilers up to test pressure, a Worthington 7½ by 1¼ by 6 billet end, outside packed, duplex steam pump, good up to 2,000 lb. is used. This pump is mounted on a chassis carried on solid-rubber-tired wheels, equipped with roller bearings. A discharge manifold incorporating stop and check valves and connections for a relief valve and a test gage is attached to and supported alongside the pump. This pump was purchased as a steam pump, but for convenience in connecting up, an air hose is used and the pump is operated from the yard compressed-air system. At front end of the chassis is a tool box for carrying miscellaneous items for connecting up the pump, also test gage, etc.



**The ideas described on this page are used in the Bayonne, N. J., refinery of Tide Water Associated Oil Co.**

# The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

# Kerosene and Its Stripping

COMMON specifications of kerosenes indicate no great difficulty in manufacture except with respect to flash point and burning characteristics (or smoke point). Although gravity does not appear in specifications it is of importance because market prices are stated in terms of gravity. Common gravities are:

| Origin— | °A.P.I. Range | °A.P.I. Average |
|---|---|---|
| Pennsylvania | 44-46 | 45 |
| Mid-Continent | 41-44 | 43 |
| N. La., Gulf Coast and N. E. Coast | 41-43 | 42 |
| California | 38-43 | .. |

The gravity of the various kerosenes in a crude oil can be determined from the Gravity Mid Per Cent Curve (see Notebook No. 26, January 13, 1945).

**Properties.**—Table 1 shows ranges of properties from special Arctic varieties to the heaviest mineral seal oils but does not include power, tractor, or insecticide kerosenes. High gravity indicates high quality except that low-boiling-range (I.B.P.) may cause excessive consumption of oil during burning, or may indicate a dangerously low flash point whereas a low gravity indicates high-boiling (E.P.) portions which tend to smoke (low smoke point), encrust the wick (high wick char), and have a high viscosity which causes the flame to die down when the oil level is low. High sulfur, particularly as disulfides, contributes to "toadstool" formations on the wick, a bloom of white, gray, or bluish material on the chimney, and obnoxious fumes particularly bad for incubators or brooders. Drafts tend to elongate the flame and cause it to smoke (need high smoke point). Smoke points range from 12-18 for the lowest-grade (often naphthenic) kerosenes to 30-36 for the finest long-burning (often paraffinic) varieties (see Notebook No. 20, December 2, 1944).

**Flash point.**—This property defies direct computation (see Notebook No. 41 on Stripping Steam) but for a single type of material such as kerosene or diesel fuel oil the relationship can be established. Such a relationship is shown in Fig. 1. It may be used for any crude oil that contains normal amounts of kerosene (i.e. 8 to 25 per cent) if a true-boiling-point distillation (see Notebook No. 24, December 30, 1944) of the crude is available. The figure can also be used with fair accuracy on the Hempel distillation curves. Evaluation of the yield of kerosene may be illustrated by evaluation curve shown in Notebook No. 31 (February 24, 1945). When a 400 E.P. naphtha is made, the yield of 44° A.P.I. kerosene is 6 per cent. According to Fig. 1, the flash point of such a kerosene, if well fractionated and well-stripped, could be as high as 150° F. Larger yields could have even higher flash points. Normally, refiners prefer to sell kerosenes of lower flash point in order to obtain better ignitability and to keep from using excessive amounts of stripping steam.

**Stripping.**—The amount of material in the product that boils below the temperature of the plate from which it is withdrawn ranges from about 8 per cent to as high as 20 per cent (see Petroleum Refinery Engineering, 2nd Ed., p. 247, McGraw-Hill Book Co., Inc.). The low values are for wide-boiling-range (large percentages of product) materials and the high values are for narrow-boiling products. Thus, if the kerosenes described above under the heading of flash point were to be stripped by steam to remove all of the material up to about 420° F. (the approximate temperature of the kerosene plate) the steam required would be enormous. The removal of customary amounts of low-flash materials by a 4-plate stripper requires the following approximate amounts of steam:

| | |
|---|---|
| 2 Per cent | 0.1 lb./gal. |
| 5 Per cent | 0.4 lb./gal. |
| 8 Per cent | 0.53 lb./gal. |

**TABLE 1—KEROSENE SPECIFICATIONS**

| | Special Arctic Export | Signal or illuminating, long burning | Domestic 41-43 ww | Domestic 44-46 ww | Fed. VV-K-211a | 300° Mineral seal or sperm, illuminating |
|---|---|---|---|---|---|---|
| Gravity, A.P.I. | 46-49 | 44-48 | 41-44 | 44-46 | ... | 36-39 |
| Flash point, °F., min. | 110-120 | 110-125 | 105-130 | 110-130 | 115 | 250-260 |
| I.B.P., °F., min. | 300-325 | 300-335 | 350-370 | 350-370 | ... | 480-540 |
| E.P., °F., max. | 465-490 | 480-600 | 480-572 | 470-572 | 572 | 600-700 |
| Sulfur, per cent, max. | 0.05-0.1 | 0.04-0.1 | 0.05-0.1 | 0.03-0.1 | 0.13 | ..... |
| Burning test, hr., min. | 24 | (*) | 24 | (†) | 24 | 20 |
| Smoke point, min. | ... | 29-34 | 25-30 | 26-32 | ... | ..... |
| Wick Char, mg./liter, max. | ... | 10 | 20 | ... | ... | ..... |
| Color, Say., min. | +30 | +25 to +30 | +16 to +30 | +30 | +16 | +16 to +25 |

*120 and 14 day; †24 and 21 day.

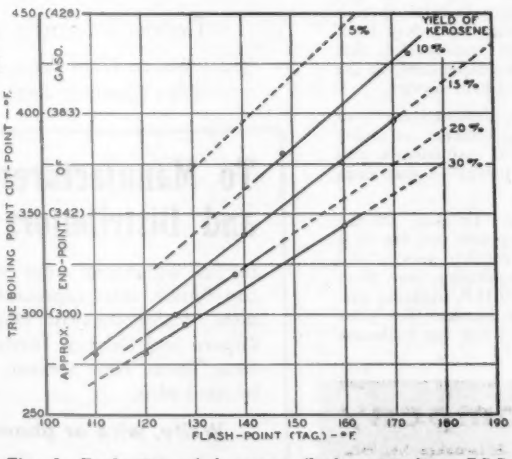
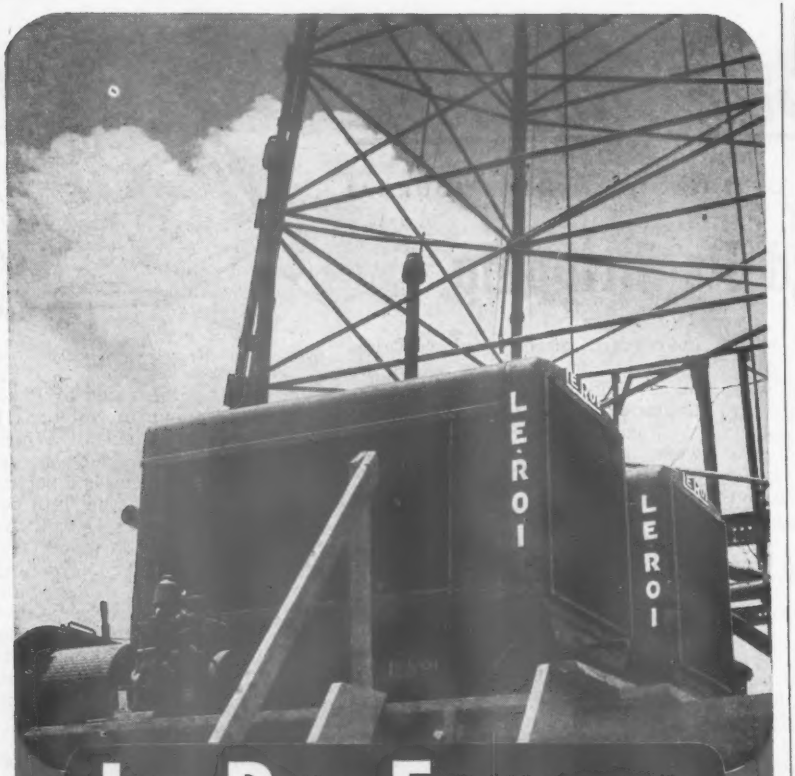



*Fig. 1—Evaluation of kerosene flash point from T.B.P. cut point and percentage yield*

**No. 58 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa**

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Engineering Fundamentals

No. 202

A FEATURE OF THE OIL AND GAS JOURNAL

# Effect of Sulfate Reduction on Conditioning of Oil-Field Water

OIL-FIELD salt waters contain in many cases between 300 and 500 p.p.m. of sulfates. The exact process by which bacteria reduce sulfates is unknown. Hydrogen sulfide is produced as a result of the reduction and the chemical reaction is represented by bacteriologists as:

$$Na_2SO_4 + 2H_2O + \text{Bacteria} \rightarrow H_2S + 2NaOH + 2O_2,$$

oxygen being used by bacteria. The reaction takes place most rapidly in summer months. In East Texas the process is only effective when the water temperatures are above 70° F.

**Effect of hydrogen sulfide on disposal water.**—The black precipitate of iron sulfide is very fine grained (nearly 25 per cent will pass 200-mesh screen) but dense. At first appearance it seems to be easy to dispose of and apparently of little importance. However, as soon as it settles in well-aerated water or water heavily treated with chlorine, the iron sulfide is oxidized slowly to ferric hydroxide with formation of hydrogen sulfide.

$$2\,FeS + O_2 + 4H_2O \rightarrow 2\,Fe(OH)_3 + H_2S + S$$

**Method of preventing hydrogen sulfide formation.**—Prevention of sulfate reduction and hydrogen sulfide production may be accomplished in several ways: (1) By oxidizing and aerating the stagnant spots in the oil water systems. Sulfate-reducing bacteria do not live well in oxygen, air, or pits which are frequently dried out, exposed to the air, and filled often. (2) By streamlining the entire oil-water system through which the water passes so that stagnation is reduced to a minimum. This can be best accomplished in closed systems where floc is at a minimum and does not have to be settled out. It takes time for bacteria to develop in sufficient quantity to produce hydrogen sulfide in harmful amounts; hence, rapid salt-water movements hinder the hydrogen sulfide process. (3) By reducing and keeping temperatures as low as possible. (4) By using bactericides at the spots where hydrogen sulfide is forming. The most important factor in combating hydrogen sulfide formation is in locating the points where it is generated. Then and only then can these spots be treated successfully. In order to locate the spots to be treated three types of chemical tests have proved to be successful: (1) Testing for hydrogen sulfide with lead acetate. (2) Determining quantitatively the amount of reduction of sulfates in the water. In other words, ascertaining the amount of sulfates at the well head and the amount in different places through the systems. (3) Measuring the oxidation-reduction potentials of the water in different parts of the disposal system to determine the state of oxidation of the water, or if it is sufficiently aerated or not.

**Method of detecting presence of hydrogen sulfide.**—The lead acetate method is commonly used to detect hydrogen sulfide. About 1 oz. of chemically pure 10 per cent lead acetate solution is placed in a 4-oz. bottle, an equal quantity of oil-field water added, and the mixture shaken. A black color indicates presence of hydrogen sulfide. The test also can be made by immersing in the salt water strips of filter paper previously soaked in lead acetate solution. If hydrogen sulfide is present the paper will turn dark.

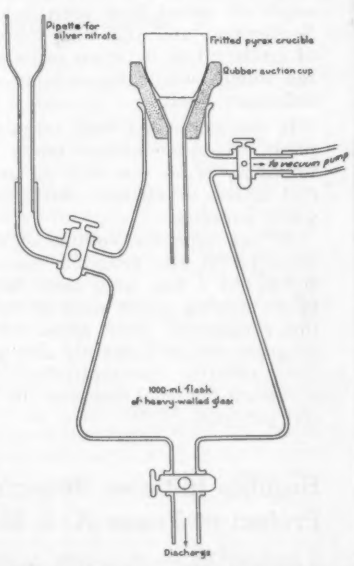


*Fig. 1—Diagram of apparatus used in determining sulfates in oil-field salt water*

**Method of determining amount of sulfate in the water.**—The sulfate ion is precipitated and weighed as barium sulfate as follows: 100 ml. of the clear filtered sample are carefully pipetted into a 400-ml. beaker, and to this are added 25 ml. of saturated ammonium chloride solution, 2 or 3 drops of methyl orange, and concentrated hydrochloric acid drop by drop until the sample is slightly acid. Next add sufficient distilled water to make a total volume of about 250 ml. Heat sample to boiling, and allow to boil a few seconds to remove any carbon dioxide present. Finally add 25 ml. of hot 10 per cent solution of barium chloride, drop by drop. The sample should be stirred well while the barium chloride is being added and allowed to remain hot (not boiling) and digest for at least 2 hours. If possible it is better that the sample be allowed to stand over night before filtering.

The sample is filtered easiest through a number 3010 medium-porosity fritted porcelain or pyrex glass crucible which has had its weight recorded. For rapid filtration it is best to use a filtering flask with a rubber adapter for the crucible (Fig. 1) and a vacuum pump. After the sample has been filtered and the beaker washed down thoroughly, the sample should be washed with small portions of hot water until all traces of chlorides have been removed. This point can be ascertained by testing the filtrate with a drop of silver nitrate solution. Finally the filter is dried in an oven and weighed. Its weight less the weight of the empty crucible will give the amount of the barium sulfate. The calculations are as follows:

$$\frac{\text{Wt. of precipitate} \times 411{,}400}{\text{Volume of sample}} = \text{p.p.m. of } SO_4.$$

Series prepared by F. B. Plummer, professor, petroleum engineering school, University of Texas

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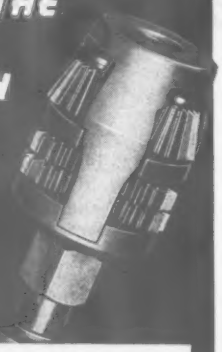

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# REFINING

## Lacy Refinery Expected to Be Finished by November

TYLER, Tex.—Ground work for the Rogers Lacy refinery in the Big Sandy area of Upshur County has been completed, and it is expected that the plant will be ready to go on stream by November. Tanks are being built. Crude from the Woodbine sand of the Hawkins field will be used.

The plant, one of the two under construction by Lacy, will have a daily capacity of 3,500 bbl. The other plant, in the Heidelberg field, between Sanders and Heidelberg, will be of similar capacity. Both will be equipped for asphalt production, but will also make gasoline, kerosene, diesel oil, and furnace oils.

## No Sharing of Crude for September Scheduled

CHICAGO.—No crude sharing is scheduled for District 2 refiners in September under the crude-allocation program established by Petroleum Administration for War. At the PAW district headquarters here it was said that no meeting of the Petroleum Industry Committee crude-oil panel had been held for September, and that the supplying of crude oil as between refiners for the month would be entirely on a voluntary basis.

It was indicated that large companies would continue for a time to supply crude, on such an unofficial basis, to refiners with inadequate supplies.

At one time the volume of crude involved in the program exceeded 60,000 bbl. a day, with some 28 suppliers sharing crude with 28 receiving companies. The scope of the program declined steadily and in recent months comparatively little crude has changed hands in the official program.

## Humble Initiates Research Project at Texas A. & M.

HOUSTON. — A 3-year research project has been placed by Humble Oil & Refining Co. with Texas A. & M. College Research Foundation, it was announced last week. The project covers an investigation of chemical reaction kinetics as applied to the processes for making high-octane aviation gasoline.

The work will be supervised by Prof. C. G. Kirkbride and Dr. P. G. Murdoch of the department of chemical engineering. One, possibly two, fellowships for advance study and research in chemical engineering as applied to the petroleum refining field will be provided by the project.

## New Interests Take Over Worth Refining Co.

CHICAGO.—New interests have acquired all holdings of Worth Refining Co., Blue Island, Ill., and the name is to be changed to Great Lakes Refining Co. J. B. Fairfield, formerly assistant to the vice president in charge of refining for Sunray Oil Co., Tulsa, is now refinery manager. Fairfield took over his new duties at the company's Chicago office.

## Houdry in Russia to Discuss Catalytic Cracking

PHILADELPHIA.—Eugene J. Houdry and Arthur V. Danner, president and executive vice president respectively of Houdry Process Corp., have arrived in Moscow to confer with the Russian Government on the operation of catalytic-cracking units installed in Russia. Their visit, sanctioned by the U. S. Government, is made at the request of the Russian Government.

Installation of eight Houdry catalytic-cracking units in Russia, with a capacity of about 25,000 bbl. per

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day of catalytic gasoline, resulted from the visit of a Russian petroleum commission to this country in 1942. The visitors studied American methods of making aviation superfuels. The units, supplied under the lend-lease agreement, will soon be ready to operate.

Houdry and Danner will conduct discussions on the efficient use of these units for the information of Russian refining technologists who will operate them, it is understood. One of the important jobs of American refining engineers and technologists during the war was installation of modern refining processes abroad and the education of foreign operators in the technique of these processes.

## High-Octane Gas Available Now at Prewar Prices

Civilian motorists this week were getting prewar premium-grade gasoline of 80-82 octane and standard grade of 75-76 octane. Prices are fixed at prewar levels, so there was no raise in prices. Special, or high-test, fuel was 85-octane. There was expected to be a third grade offered, 70-octane.

## Russians Getting Antiknock Element From Turpentine

CHICAGO.—An aviation-gasoline constituent "twice as efficient as iso-octane," is being derived from turpentine in Russia, according to Russian scientific literature translated and reviewed by J. G. Tolpin, editor of the U. O. P. Survey of Foreign Petroleum Literature.

This antiknock compound, "Uratol," grew out of research conducted by V. G. Plyusnin, in the Ural division of Academy of Sciences, and it was produced in large-scale laboratory equipment in 1943.

Turpentine also is employed as a motor fuel for trucks, tractors, and other motorized equipment in the lumber industry, although its principal function seems to be to start engines which operate on producer gas.

According to one author, turpentine as a motor fuel presents difficulty, particularly with respect to acidity and gum, and larger carburetor jets are necessary because of the higher viscosity of turpentine as compared with gasoline. Furthermore, means for preheating the fuel-air mixture to 60° C. are required. Another author, however, states that Soviet-made tractor engines designed for gasoline require no changes in order to burn turpentine.

Another product of research in wood chemistry is a lubricating oil made from wood-tar fractions. More than 100 commercial units to produce such lubricating oils were under construction in 1943 in Russia.

## Chemists Develop Aviation Fuel "Safe as Kerosene"

NEW YORK.—Development of a high-octane aviation fuel with a remarkable safety factor was announced last week, along with demonstration of its qualities by technicians of Standard Oil Co. (New Jersey) and Pan American World Airways. The new fuel, aviation engineers say, will increase utilization of commercial aircraft by making refueling in air practical for long-range operation. The fuel packs all the power of 100-octane gasoline, but is so resistant to accidental ignition that a lighted match can be dropped into it without causing a fire.

E. V. Murphree, vice president of the central technical organization of Standard Oil Co. (New Jersey), said research chemists had succeeded in harnessing hydrocarbons into fuel as safe as kerosene, but with combustion power equal to the best fast-vaporizing gasolines. He pointed out that conventional motor and aviation gasolines ignite readily and burn rapidly when spilled because of the inflammable vapors formed. The fuel demonstrated must be heated to more than 100° F. to produce enough vapors to ignite, thus eliminating the dangers of flash fire from fast-vaporizing gasoline that might be set off by a spark.

## Register Established for Clearing Patents

WASHINGTON. — Establishment of a patent register, in which owners of patents may register their patents for licensing purpose, has been announced by the U. S. Patent Office. The purpose of the register is to become a point of contact between owners of licensable patents and possible licensees. Patent ownership of record in the Patent Office is required for entry in the register.

Anyone who has a right to license a patent may enter it on this register; no fee is charged for the register service. The Patent Office cannot undertake to aid a patent owner in negotiations with a prospective licensee, nor does the office assume any responsibility for license applications in the event of registration of a patent. Specific licensing terms need not be stated when a patent is registered but the owner must state that he will license it on reasonable terms, or will assign it. Registration of a patent for licensing will be published also in the weekly Patent Gazette.

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## Elbow-Holding Fixture Expedites Work

A difficult, unsafe job is made comparatively easy by means of a device developed for use at the polymerization plant of Sinclair Refining Co., Marcus Hook, Pa.

In order to reactivate the catalyst, it is necessary to disconnect the line, remove a spool, turn an elbow about 45°, and insert a new spool to connect the outlet to the reactivating line. Formerly the ell had to be held while the bolts in the flanges were removed, then lowered to the working platform and raised again to the new position above the work-

men's heads where it was held until the bolts were tightened. Four men were required. The stand shown in the illustration holds the ell at the proper height, and eliminates the lifting and holding. The fixture consists of a base on which is mounted a hollow column supported by braces to the base. A threaded rod fits in the hole in the column and on top of the rod is a cradle made to fit the ell. The cradle is raised to the proper height for supporting the ell, and held there by lowering the nut on the threaded portion of the rod until it is against the top of the column. After the cradle is in position, the bolts in the flanges of the ell are removed, the ell is turned to the new position, by turning the cradle in the column, where the bolt holes in the flanges are lined up and bolted fast. Another advantage is that the gaskets can be reused.

**Isaac Tafur,** petroleum geologist, has joined the geological staff of International Petroleum Co. at Negritos, Peru, where he will specialize in subsurface work.

# Natural Gas

## Acquisition of Five Affiliates Sought by United Fuel

WASHINGTON. — Federal Power Commission will hold a hearing September 19 on the application of United Fuel Gas Co. for permission to acquire five affiliated companies: Central Kentucky Natural Gas Co., Cincinnati Gas Transportation Co., Huntington Development & Gas Co., Point Pleasant Natural Gas Co., and Warfield Natural Gas Co. All six have the same executive officers. They are subsidiaries of Columbia Gas & Electric Corp.

The applicants state that the merger will permit simplification and reduction in the number of corporate entities, reduce duplication of records and reports and result in other economies.

In connection with the merger United proposes to increase its common stock from 300,000 shares, $1 par value, all outstanding, to 600,000 shares. The five companies other than United would be dissolved.

## Freight Rates on Liquefied Gas Excessive, Says Shell

WASHINGTON. — Excessive freight rates on shipments of liquefied gas have been charged by virtually all railroads in the Middle West since August 8, 1943, according to a complaint filed by Shell Oil Co., Inc., the rates being based on an estimated weight of 6.6 lb. per gallon. The commission is asked to investigate and establish charges based on an estimated weight of 4.7 lb. per gallon and by reparation pay the complainant $170,000, with interest.

## Channel-Black Projects Are Canceled by WPB

WASHINGTON.—War Production Board has canceled three projects designed to increase the production of channel black, important ingredient in the manufacture of tires. All were to have been financed by the Government. Two called for expansion of facilities: one to be operated by Cabot Carbon Co., at Eunice, N. M., and the other by Jefferson Lake Sulphur Co. at Clemons, Tex. The third project was a contemplated pipe line for C. E. Johnson at Stonewall, Okla. No construction had been started on any of the projects.

## Ohio Fuel Plans 18½ Miles Of Transmission Line

WASHINGTON.—Ohio Fuel Gas Co. is planning construction of 18½ miles of 5-in. and 6-in. transmission pipe line from Urbana to Bellefontaine, in Ohio, along with a gas-pressure regulating and measuring station. The addition facilities are needed, the company says, to enable it to supply natural gas at wholesale to the city of Bellefontaine, which now owns and operates a municipal manufactured-gas distribution system. Federal Power Commission will hold a hearing in Columbus, Ohio, on September 13 on the company's application for permission to construct the facilities named.

## No Reason for Postponing Hearings, Says FPC

WASHINGTON.—Inquiries as to the possible postponement of regional natural-gas hearings scheduled by Federal Power Commission have prompted the commission to issue a statement that "it would appear that no reason exists for postponing those hearings, and it is the commission's intention to hold them as scheduled." The dates set for the hearings are: Kansas City, commencing September 18; Oklahoma City, commencing October 9; New Orleans, commencing October 30; Dallas, commencing November 27.

## Government Sees Bright Future for Helium Gas

WASHINGTON.—There is a bright postwar era, the Bureau of Mines says, for helium, the noninflammable gas which kept Navy blimps flying during the war. The Government will maintain huge reserves in its Texas, New Mexico, and Kansas fields for military defense purposes, but it is hoped private industry will utilize surpluses.

Some civilian uses already have been found. Private industry and the Government are hunting for more. Helium has been found satisfactory in the welding of light metals. Many of these oxidize or burn rapidly when welded, but if the job is done in a helium atmosphere, the oxidization is retarded.

The bureau believes there is a postwar medicinal use for helium. Some anaesthetics are explosive. If a little helium is mixed with them the danger of explosions in hospitals and homes is lessened.

Also helium will be available for weather balloons and for any blimps manufactured for civilian and military use.

Among experiments which may bring additional use of the gas is one in connection with steel manufacture. If a process can be perfected for making steel in a helium instead of air atmosphere, a pure product might result.

The canning industry may experiment with use of helium atmosphere to prevent air from getting into cans.

## Outlet for Harleton Natural Gas Field in Prospect

MARSHALL, Tex.—Plans for construction of an 18-mile 8-in. natural-gas pipe line from the Harleton field, in northwestern Harrison County, to Daingerfield, Morris County, have been announced by Arkansas Louisiana Gas Co. Pipe is available, and a survey has been made, according to company officials.

## PAW Revokes Three of Its Wartime Restrictions

WASHINGTON. — Revocation of three wartime directives on natural gas and gas condensates were announced last week by Petroleum Administration for War, effective November 1. The directives provide for maximum production of liquid hydrocarbons, butane, isobutane and isopentane, all essential ingredients of aviation gasoline, and restrict the use of butane in well-drilling operations.

# Cycling

## Shell Plans Construction of Cycling Plant at Sheridan

HOUSTON. — Plans for construction of a cycling plant at Sheridan, Colorado County, to cost about $3,000,000 have been announced by Shell Oil Co., Inc. The plant will process 100,000,000 cu. ft. of natural gas daily. Liquid products from the plant will be used at Shell's refinery on the Houston Ship Channel in the manufacture of high-octane gasoline.

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# PIPE LINES

## WEP Future Presents Perplexing Problems

THE petroleum industry will propose to Congress when it reconvenes this fall that the two Government-built big-inch and little big-inch of War Emergency Pipelines, Inc., be completely withdrawn from use and neither sold nor leased to private oil interests.

This proposal has been drawn up by the special oil industry committees appointed to study and make recommendations to the Senate petroleum investigating committee concerning disposal of Government-owned oil facilities.

Congress will be told that these two war emergency lines, with their combined capacity of carrying over 500,000 bbl. of oil daily from Texas to the East Coast, could easily disrupt the entire private peacetime economy if used either as state carriers or turned over to private interests.

No special objections will be made, however, to conversion of the lines to natural gas, although some oil groups as well as the coal and railroad industries are known to oppose such action.

The whole controversial subject will be thrown open to public hearings in the latter part of September. Meanwhile, Sen. Joseph O'Mahoney, chairman of the investigating committee, has called on industry, labor and local governments and others interested in the disposal of Government-owned petroleum facilities to submit their suggestions to him not later than September 10.

As to the disposal of Government-owned 100-octane plants, the industry's report recommends sale—but not lease—to private concerns. This is qualified by suggestions that the plants be evaluated at adequately high prices, that no Government financial aid be given the purchasers, and that a 25 per cent cash-down payment be required.

With regard to the Big and Little Inch lines, four specific recommendations have been prepared:

1. They should not be scrapped because of the military value in case of another national emergency.

2. They should not be utilized for transportation of petroleum or petroleum products either to the East Coast or to inland points.

3. Under certain conditions it may be feasible to convert them to natural gas.

4. Unless they are converted to gas, Congress should take appropriate action to withdraw the lines from use.

As for the four other war emergency pipe lines, conclusions are that they should be either sold to interested parties or scrapped, since their military value is negligible while their small size makes them of no great threat to private competitive enterprise.

These four lines are (1) the 82-mile Ohio Emergency from Tiffin to Doylestown, with a capacity of 20,000 to 25,000 bbl. daily; (2) the 198-mile trans-Florida emergency from Carabelle to Jacksonville, with capacity of 27,000 bbl. daily; (3) the 175-mile extension to the Plantation line, from Greensboro to Richmond, with capacity of 30,000 bbl. daily; and (4) the 185-mile Southwest Emergency from Refugio to Houston, Tex., used as a feeder for the Big Inch line.

The 1,254-mile Big Inch and the 1,475-mile Little Inch lines, however, are of such huge capacity that the report concludes they could not be fitted into the peace-time oil economy without completely disrupting the existing system.

Briefly, the argument runs like this:

It is contrary to the principles of a free American economy to use these lines, built by the American taxpayers as war facilities, as State carriers in competition with private enterprise.

In addition to the proposals of the industry committee, it is reported in Washington that two additional suggestions have been made by industry men: (1) Both lines should be sold with the understanding that they would be dug up and relaid in some foreign area, probably the Near East, where a big oil expansion is expected after the war. (2) On the theory that the United States will be a heavy importer of oil in the next 10 or 15 years, another suggestion is that the pipe lines should be held in reserve until then and at that time the flow would be reversed so that oil would move westward.

Despite the petroleum industry's projected recommendation to Congress that the big-inch and little big-inch pipe lines be kept idle, the Reconstruction Finance Corp. is

planning for some use to be made of the lines, it was learned.

The RFC, which is now making cost studies with a view of determining the exact relationship between tanker and pipe-line transportation, takes the position that it is required by law to sell the pipe lines within 1 year after the cessation of hostilities.

This is provided for in the articles of incorporation of the War Emergency Pipelines Act. Unless that act is amended by Congress, RFC expects to proceed with the sale of the pipe lines to private interests.

RFC officials hold the view, however, that the petroleum industry has several factors working in its favor, at least in so far as immediate disposition of the pipe lines is concerned.

Foremost among these, it is held, is a basic conflict between the War Emergency Pipelines Act and the Surplus Property Act. While the former provides for sale of the pipe lines within a year after the war's end, policies governing surplus disposal may raise issues to obstruct such a sale.

The Surplus Property Act provides that one objective is to "dispose of surplus property as promptly as feasible without fostering monopoly or restraint of trade, or unduly disturbing the economy," an objective which the RFC might find difficult to overcome in any attempt to sell the pipe lines to private interests.

Another objective of the act is to "discourage monopolistic practices and to strengthen and preserve the competitive position of small business concerns in an economy of free enterprises."

The combined effect of these objectives, as well as the act's manifest preference for local, independent capital, will, in the opinion of RFC officials, present large problems to any contemplated disposal of pipe lines.

A further requirement of the Surplus Property Act states that the pipe lines and other property valued at $5,000,000 or more must be reported to Congress together with a report outlining the economic problems involved and setting forth a plan or program for their disposition.

## RFC Reduces Rates of WEP

The Reconstruction Finance Corp. last week announced a reduction in rates for transporting petroleum products through the big-inch crude-oil line and little big-inch products line of War Emergency Pipelines, Inc.

After September 1, the RFC will reduce the pipe-line tariff to a rate equivalent to current war shipping tanker rates, the announcement said, permitting East Coast purchasers to acquire crude and petroleum products at prices equivalent to what they would pay if the products were imported from the Gulf Coast to the eastern seaboard by tankers.

RFC previously announced that the subsidy program for the transportation of crude petroleum and products to the East would be terminated September 1.

From February 1943, through August 1945, the big-inch line transported to the eastern seaboard area approximately 260,750,000 bbl. of crude oil, the RFC said. From March 1944 through August 1945 the little big-inch moved to the eastern seaboard about 107,125,000 bbl. of petroleum products.

From gulf ports to north Atlantic ports the tanker rate is 40 cents a barrel for gasoline, 42 cents for heating oil and 43 cents for crude, the RFC said. To meet gathering costs the agency will charge an additional 14.7 cents a barrel for shipment of crude from East Texas fields to gulf refineries, 14.1 cents for Southwest Texas crude and 26 cents for West Texas crude.

The pipe-line charge has been 80 cents a barrel for crude and 65 cents a barrel for gasoline and heating oils.

## Gulf's 490-Mile Loops To Cost $7,000,000

Gulf Refining Co., pipe line division, has filed application with the Petroleum Administration for War to enlarge its sweet crude transportation facilities from the West Texas Permian Basin to Port Arthur on the Gulf Coast.

The plans call for laying of 490 miles of new 10-in. line at an estimated cost of $7,000,000.

Gulf is seeking to complete certain loops on its pipe line from the Keystone Ellenburger sweet oil pool in the Permian Basin to its refinery at Port Arthur in order to add 30,000 bbl. capacity. New pumping equipment also would be added to the line.

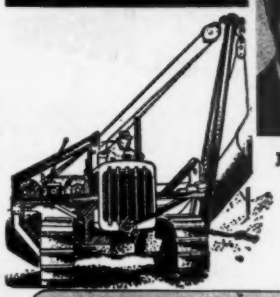
## Bell Interests Extend Pipe Line System

The Bell Oil & Gas interests have commenced the construction of a 35-mile line and gathering system from the Aylesworth area and the Mead pool of Marshall County, Oklahoma, to the Ben Franklin refinery at Ardmore, Okla.

Pipe is now on the job and the first stretch of the line will be built immediately from the producing fields on to Madill.


PIPELINE "Know-how"

J. H. SMITH
Partner



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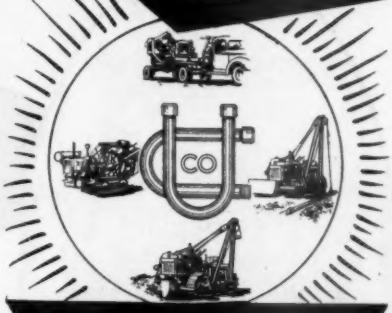

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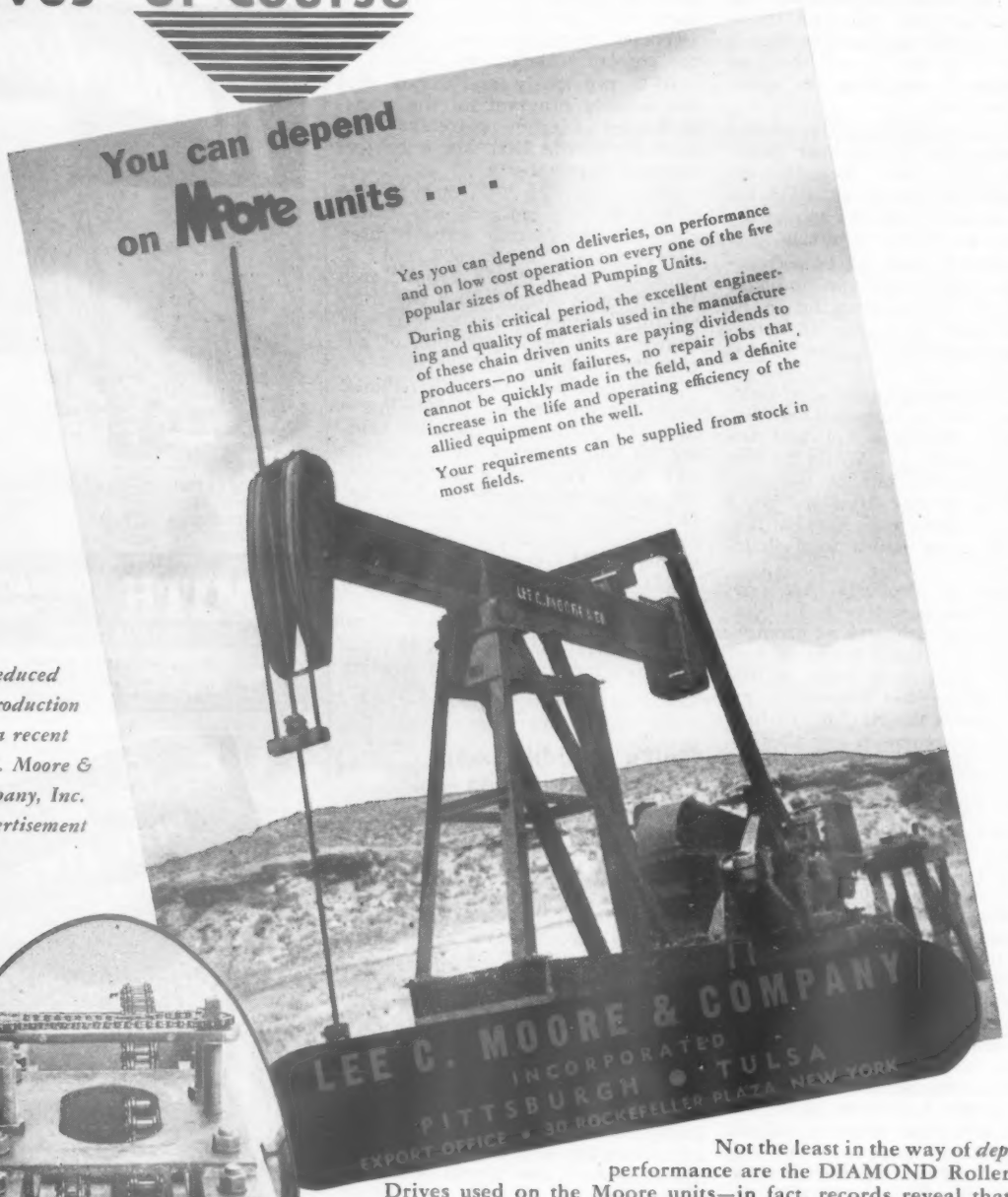
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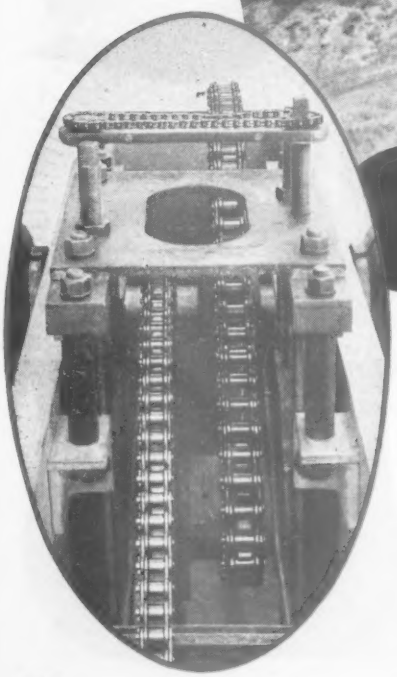

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# Exploration and Drilling

## Week's Highlights

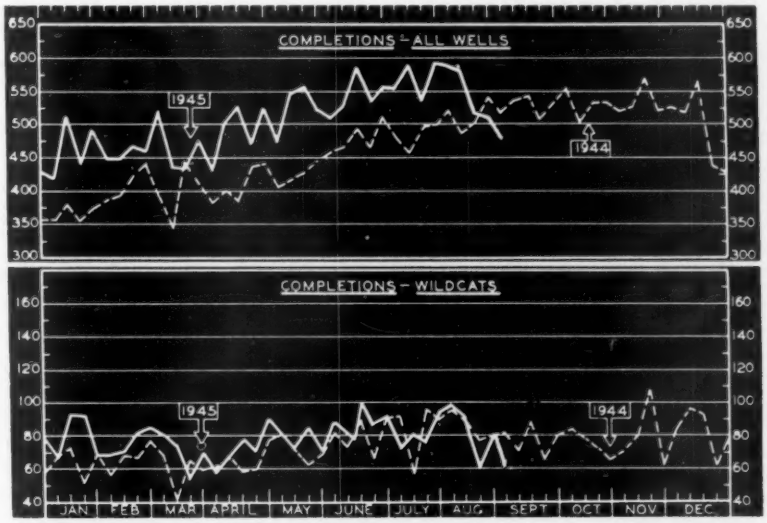
POSSIBILITIES of a major pool of the stratigraphic-trap type at a depth making it a "poor man's play", loomed in the Delhi area of Richland Parish, Louisiana, as R. J. Caraway 1 Bryant, SE NW 35-17n-8e, cored oil sand at 3,069-73 ft. and 3,147-67 ft., recovering saturated sand with no indications of water.

The new test is almost exactly half way between the original Delhi pool and the subsequently discovered Big Creek pool, being 3 miles west of Delhi and 3 miles east of Big Creek. The lower sand in the Bryant test is being tentatively correlated with the Holt sand (Paluxy) in the Delhi pool.

There is now a probable proven area approximately 8½ miles long, east and west, by about 1½ miles wide, north and south. It is still open on both east and west ends, produces from about three sands, oil is about 38° gravity, depth 3,000 to 3,200 ft.

The oil is trapped in pinchouts against the Monroe-Richland Uplift along the old shore line, with the formations appearing to dip from about 100 ft. per mile from the pinchout, and production likely through about 150 ft. of dip. (See The Oil and Gas Journal, December 16, 1944, page 119; February 3, 1945, page 85, and July 21, 1945, page 167.

Assuming, as seems likely, that all the present 8½ mile length connects up, the ultimate length of the field is probably a matter of pure speculation. As an example of the possibilities, turning a map of the West Edmond field on its side, so




***Solid line charts current weekly completions, service wells in Eastern area included***

## WEEKLY WELL COMPLETIONS . . . WEEK ENDED SEPTEMBER 1, 1945

| | Total of all wells | | | | | Cum. to date | | Wildcat completions and discoveries | | | | | Cumulative total, 1945 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Comp. | Oil | Gas | Dry | Footage | 1945 | 1944 | Oil | Dist. | Gas | Dry | Total | Oil | Dist. | Gas | Dry | Total |
| New York | 32 | 16 | 0 | *16 | 46,408 | 953 | 1,071 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania | 83 | 45 | 3 | †35 | 131,970 | 2,732 | 2,712 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| West Virginia | 14 | 2 | 11 | 1 | 36,261 | 533 | 585 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ohio | 2 | 0 | 1 | 1 | 3,032 | 601 | 646 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 41 | 52 |
| Indiana | 5 | 1 | 0 | 4 | 11,458 | 132 | 153 | 1 | 0 | 0 | 1 | 2 | 5 | 0 | 0 | 22 | 27 |
| Kentucky | 8 | 3 | 2 | 3 | 25,159 | 340 | 470 | 0 | 0 | 0 | 2 | 2 | 17 | 0 | 2 | 33 | 52 |
| Illinois | 37 | 26 | 0 | 11 | 94,385 | 1,155 | 1,222 | 0 | 0 | 0 | 7 | 7 | 30 | 0 | 0 | 204 | 234 |
| Michigan | 5 | 2 | 0 | 3 | 8,650 | 481 | 420 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 3 | 161 | 170 |
| Kansas | 45 | 18 | 7 | 20 | 133,747 | 1,126 | 1,202 | 2 | 0 | 0 | 6 | 6 | 24 | 0 | 11 | 234 | 269 |
| Neb., Mo., Iowa | 4 | 0 | 0 | 4 | 9,295 | 17 | 22 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 12 | 12 |
| Oklahoma | 35 | 20 | 4 | 11 | 141,029 | 1,595 | 1,142 | 1 | 0 | 1 | 7 | 9 | 60 | 2 | 14 | 243 | 319 |
| Texas | 131 | 75 | 20 | 36 | 526,675 | 4,791 | 3,645 | 3 | 0 | 3 | 16 | 22 | 144 | 12 | 43 | 853 | 1,052 |
| North Central | 49 | 35 | 0 | ‡14 | 127,727 | 1,455 | 984 | 1 | 0 | 0 | 6 | 7 | 56 | 0 | 5 | 305 | 366 |
| West | 16 | 12 | 1 | 3 | 63,110 | 1,206 | 1,011 | 1 | 0 | 0 | 2 | 3 | 39 | 1 | 0 | 178 | 218 |
| Panhandle | 11 | 3 | 7 | 1 | 30,588 | 377 | 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 6 |
| Eastern | 11 | 2 | 5 | §4 | 66,692 | 219 | 211 | 0 | 0 | 0 | 2 | 2 | 5 | 6 | 1 | 55 | 67 |
| Gulf Coast | 30 | 20 | 3 | 7 | 189,881 | 1,086 | 797 | 1 | 0 | 3 | 4 | 8 | 31 | 4 | 29 | 186 | 250 |
| Southwest | 14 | 3 | 4 | 7 | 48,677 | 448 | 482 | 0 | 0 | 0 | 2 | 2 | 13 | 1 | 7 | 124 | 145 |
| Louisiana | 21 | 9 | 4 | 8 | 118,551 | 674 | 529 | 0 | 0 | 1 | 2 | 3 | 22 | 3 | 5 | 85 | 115 |
| Northern | 14 | 6 | 4 | 4 | 66,182 | 255 | 204 | 0 | 0 | 1 | 1 | 2 | 6 | 1 | 5 | 49 | 61 |
| Southern | 7 | 3 | 0 | 4 | 52,369 | 419 | 325 | 0 | 0 | 0 | 1 | 1 | 16 | 2 | 0 | 36 | 54 |
| Arkansas | 2 | 1 | 0 | 1 | 11,264 | 119 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 28 |
| Mississippi | 3 | 1 | 0 | 2 | 21,459 | 240 | 90 | 0 | 0 | 0 | 2 | 2 | 5 | 0 | 0 | 80 | 85 |
| Southeastern | 1 | 0 | 0 | 1 | 3,460 | 40 | 25 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 27 | 28 |
| Montana | 5 | 4 | 1 | 0 | 12,599 | 206 | 237 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 18 | 25 |
| Wyoming | 3 | 3 | 0 | 0 | 13,471 | 135 | 111 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 25 | 37 |
| Colorado | 1 | 1 | 0 | 0 | 6,421 | 25 | 22 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 4 | 6 |
| New Mexico | 3 | 2 | 0 | 1 | 8,412 | 284 | 262 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 4 | 36 | 48 |
| California | 36 | 29 | 3 | 4 | 177,509 | 1,572 | 1,316 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 2 | 157 | 161 |
| Total United States | 476 | 258 | 56 | 162 | 1,541,215 | 17,751 | 16,032 | 7 | 0 | 5 | 49 | 61 | 343 | 17 | 97 | 2,263 | 2,720 |
| Total previous week | 509 | 282 | 47 | 180 | 1,682,404 | 17,275 | 15,520 | 14 | 0 | 4 | 64 | 82 | 337 | 17 | 92 | 2,213 | 2,659 |
| Total Sept. 2, 1944 | 519 | 271 | 63 | 185 | 1,573,697 | 16,032 | 11,054 | 16 | 0 | 5 | 61 | 82 | 288 | 20 | 88 | 2,139 | 2,533 |

**Service wells included: *16, †33, ‡1, §2.**

that the east side pinchout faces about north, will give a picture of what can happen in the Delhi area.

The limits of production along the length of the field will probably be determined by sedimentary conditions that change the present reservoir sands to a nonporous shale, although there are other things that could have happened that either prevented deposition of the reservoir sands or eroded them after deposition.

## MISSISSIPPI

### Chalk Tested for Gas In Heidelberg Field

JACKSON.—In the Heidelberg field of Jasper County, the Gulf Refining Co. is testing the upper chalk section, which has shown indications of possible gas production in several wells. Gulf 4 Dantzler, approximately NE SE SW 32-1n-13e, was squeezed above and below the section to be tested, and casing has been perforated at 3,980-4,000 ft. On a drill-stem test, the well flowed gas through ¼-in. choke with 35 lb. pressure after tool was open 5 minutes. Pressure started declining and dropped to 5 lb. in 2 hours. Drill-stem testing is still in progress.

Union Producing Co. 21 Stevens, 12-10n-3w, in the Tinsley field of Yazoo County, thoroughly tested all possible Smackover producing possibilities and got only very slight gas shows. The well has been plugged back and will be completed in the new Brumfield sand.

Five new locations have been announced this week, three field starts and two wildcat tries. The wildcats are scheduled one each for Newton and Warren counties.

**MISSISSIPPI WILDCAT FAILURES**

Greene County: Humble 2 Stover et al, 2,150 ft. south and 525 ft. west of NE corner of 20-3n-7w, dry, TD 9,787 ft., Comanche 9,050 ft.

Yazoo County: J. W. Sorrells 1 Ledbetter, NE NE NE 32-11n-1e, dry, TD 6,521 ft., Eutaw 5,983 ft.

**FLORIDA WILDCAT FAILURE**

Calhoun County: Pure 1 International Paper Co., 1,485 ft. west and 495 ft. south of NE corner of 25-1s-11w, dry, TD 3,460 ft.

## ILLINOIS

### Wells Have High Average Initial Production

CENTRALIA.—Twenty-six oil wells, with a total initial production of 4,789 bbl., or an average of 184 bbl. per well, were reported completed in Illinois in the past week, together with 11 dry holes, 7 of which were wildcats. No productive wildcats were completed.

The largest new well was J. J. Lynn and Pure Oil Co. 1 T. L. McKnight, SE SE NW 9-6n-10e, in the North Boos pool, Jasper County. It flowed 771 bbl. in 24 hours from acidized Rosiclaire lime at 2,752-57 ft., total depth 2,768 ft. It extends the pool a half mile easterly. An unusually good well for the Mattoon pool in Coles County was Howard Gordon et al 1 E. S. Watson, SW NE NE 3-11n-7e, which is good for 302 bbl. in 24 hours from Cypress sand at 1,788-1,812 ft., which had been given a small shot of nitroglycerin, and Aux Vases sand at 1,938-70 ft. The Noble pool in Richland County contributed a 300-bbl. well in Pure Oil Co. 5 R. M. Rusk, SW SE SE 19-3n-9e, from McClosky lime at 2,986-93 and 3,003-07 ft. while the Clay City pool in Wayne County came through with a 347-bbl. well in Pure's 1 L. E. Barnes, NE NE NE long Section 6-1n-8e, from acidized Rosiclaire lime at 3,003-10 ft. In Jefferson County the well of the week was The Texas Co. 4 K. Boyer, SW NW SE 23-1s-3e, Divide West pool, which was good for 445 bbl. initially from acidized McClosky lime at 2,740 ft.

The Parkersburg pool in Edwards County was given a new pay by R. B. Martin and Central Pipe Line Co. 1 Gadeau, C N½ NW NE 6-1n-14w, which pumped 10 bbl. per hour from Cypress sand at 2,846-61 ft.

Forty-three new operations were started, including seven wildcats, as follows: Skelly Oil Co. 1 E. W. Jacobson, NE NE NW 31-3n-3e, and Engle and Nash 1 O. A. James, NE NW NW 22-2n-3e, Marion County; J. J. Lynn 1 H. Brissenden, NE NW NW 22-3n-8e, Clay County; Pure Oil Co. 1 J. C. Howard-A, NW NW SW 13-2n-9e, Richland County; Aetna Oil & Refining Co. 1 Spangler, NE NE SE 12-2s-1e, Jefferson County; National Associated 1 A. Dolby, SE SW NE 6-6s-8e, White County, and Pure Oil Co. 1 E. D. Bayler, NE SW SE 2-2n-7e, Clay County.

**ILLINOIS WILDCAT FAILURES**

Fayette County: Fred J. Pfunder 1 Myers estate, NE NE SW 14-7n-1w, dry at 1,593 ft. Glen Dean 1,197 ft., Benoist 1,475 ft.

Jefferson County: T. B. Dirickson 1 Schneider, SW SW SE 23-1s-3e, dry at 2,391 ft. Fredonia limestone top 2,334 ft.

Lawrence County: Sam Males 1 V. Funk, NE SE NE 32-4n-10e, dry at 1,185 ft.

Marion County: Schlafly & Slivka 1 B. F. Young, SW SE SW 6-2n-2e, dry at 1,937 ft.

Wabash County: C. E. Skiles and Olds Oil 1 H. Berninger, NE SW NW 18-1n-13w, dry at 2,900 ft. Lower O'Hara 2,783-87 ft.

Wilson Drilling Corp. 1 Crowell heirs, SW SW NE 24-1n-13w, dry at 2,522 ft. McClosky lime at 2,505-17 ft.

Wayne County: Kiowa Drilling Co. 1 et al P. J. Thilmany, SE NE SW 21-1s-6e, dry at 3,250 ft. McClosky lime 3,206-10 ft.

## N. CENTRAL TEXAS

### New Caddo Pool Opened Northwest of Olney

WICHITA FALLS.—Robertson Drilling Co. 1 J. T. Richardson, Block 14, J. Scott Survey, a wildcat 4 miles northwest of Olney in southern Archer County, perforated with 30 shots from 4,704-20 ft. in the Caddo. It is shut in for storage. Ellenburger was topped at 5,170 ft. Total depth is 5,222 ft. Manning & Brown, Inc., 1 Nichols, Lot 2, Block 50, ATNCL Survey, a wildcat northeast of the Hull-Silk pool, Archer County, ran a 5-minute drill-stem test at 5,494 ft. Gas came to the surface in 4 minutes with recovery of 130 ft. of oil and 150 ft. of oil-cut mud. Ellenburger was topped at 5,474 ft. The test was drilled to 5,543 ft. and 5½-in. casing cemented at 5,540 ft. Operator is perforating.

Continental Oil Co. 1 Slayton, G. F. Lawrence Survey, a wildcat 5 miles southwest of Bellevue in Clay County, drilled sand showing oil from 5,235-55 ft. On a 30-minute drill-stem test from this zone 55 ft. of drilling mud was recovered. It was drilling below 5,548 ft. in shale. Fred Snuggs 2 Almon, A. A. C. Bailey Survey, Cooke County, promises to be the second producer in the shallow pool opened by 1 Almon recently. On a 30-minute drill-stem test from 2,942-50 ft., 180 ft. of oil and 90 ft. of oil-cut mud was recovered.

Ohio Oil Co. will drill a 7,000-ft. wildcat 10 miles northwest of Guthrie in King County. It is 1 Pitchfork Land & Cattle Co., 660 ft. out of the most northerly northwest corner of Section 1, Somerville County School Land Survey.

Archer County led this district in field completions with 10, Wichita County had

### DAILY AVERAGE PRODUCTION FOR WEEK

| | Sept. 1 crude oil | Distillate, allied products | September PAW quota all oils | Aug. 25 crude oil |
|---|---|---|---|---|
| Alabama | 1,000 | ..... | 500 | 1,000 |
| Arkansas | 78,650 | 5,400 | 80,400 | 79,000 |
| California | 884,750 | 60,970 | 946,970 | 915,500 |
| Colorado | 12,300 | .... | 12,000 | 11,250 |
| Eastern | 65,750 | 6,300 | 72,500 | 61,100 |
| Florida | 200 | ..... | ..... | 200 |
| Illinois | 200,600 | 12,000 | 212,000 | 198,800 |
| Indiana | 13,400 | .... | 13,000 | 13,300 |
| Kansas | 272,050 | 4,500 | 278,500 | 266,550 |
| Kentucky | 28,700 | 2,600 | 30,600 | 28,750 |
| Louisiana | 365,900 | 42,000 | 392,000 | 365,450 |
| North Louisiana | 70,200 | ..... | ..... | 69,750 |
| South Louisiana | 295,700 | ..... | ..... | 295,700 |
| Michigan | 46,450 | 800 | 47,800 | 46,700 |
| Mississippi | 54,350 | ..... | 47,000 | 53,650 |
| Montana | 23,300 | 300 | 22,300 | 23,500 |
| Nebraska | 850 | .... | 1,000 | 850 |
| New Mexico | 103,500 | 6,800 | 106,800 | 103,500 |
| Oklahoma | 390,100 | 28,000 | 408,000 | 389,000 |
| Texas | 2,222,700 | 166,000 | 2,144,000 | 2,222,700 |
| East Texas | 380,900 | ..... | ..... | 380,900 |
| East Central Texas | 145,600 | ..... | ..... | 145,600 |
| North Central Texas | 152,850 | ..... | ..... | 152,850 |
| Texas Panhandle | 88,000 | ..... | ..... | 88,000 |
| West Texas | 526,650 | ..... | ..... | 526,650 |
| Southwest Texas | 361,100 | ..... | ..... | 361,100 |
| Texas Gulf Coast | 567,600 | ..... | ..... | 567,600 |
| Wyoming | 107,500 | 3,500 | 96,700 | 108,000 |
| Total United States | 4,672,050 | 339,170 | 4,912,070 | 4,888,800 |
| Change from previous week | down 16,750 | | | |

Total production January 1-September 1, 1945 ..... 1,177,857,675 bbl.
Same period last year ..... 1,101,346,750 bbl.

7 and Jack County had 4. Cooke and Wichita counties had 10 field locations each and Archer and Jack counties each had five.

In West Central Texas, Stephens and Taylor counties each had three field completions. Coleman and Stephens counties each had two new field locations.

**NORTH CENTRAL TEXAS SUCCESSFUL WILDCAT**

Cooke County: New oil pool—Fred Snuggs 1 L. M. Almon, J. M. Randolph Sur. A-868, 3½ mi. E and 1 mi. N Gainesville, elev. 829 ft., IP 89 bbl. day, perf. 2,898-2,907 ft. Strawn, gravity 35°, TD 2,912 ft.

**NORTH CENTRAL TEXAS WILDCAT FAILURES**

Archer County: Frank Wood and C. L. Abercrombie 1 L. L. Hudson est., Lot 83, J. W. Harris Sudb. Club Ranch, 1 mi. S and 5 mi. W Archer City, dry, TD 1,399 ft.

Childress County: Texas 1 F. & M. Trust Co., Sec. 644, Blk. 11, W&NW Sur., 4 mi. NW Childress, elev. 1,906 ft., Ellenburger 7,535 ft., dry, TD 7,618 ft.

Foard County: Humble 1 Furd Halsell, Sec. 266, Blk. A, H&TC Sur., 7 mi. S and 8 mi. W Crowell, elev. 1,341 ft., Ellenburger 6,050 ft., dry, TD 6,055 ft.

Wichita County: Fortex Oil et al 1 H. Barwise, James Cole Sur. A-37, 7 mi. W and 1½ mi. N Clara, dry, TD 2,005 ft.

F. H. Schram et al 2 G. T. West, Lot 59, KWVFL Sur., 2 mi. NW of Holliday, dry, TD 1,854 ft.

Young County: Deep Rock Oil 1 S. J. Roach, Sec. 1204, TE&L Sur., 1 mi. N Eliasville, elev. 1,065 ft., dry, TD 4,570 ft.

## EASTERN TEXAS

### Cherokee Co. Test Is Dry in Travis Peak

DALLAS.—Humble Oil & Refining Co. 1 Maness, J. M. Musquez Survey, a wildcat 8 miles southeast of Rusk, Cherokee County, is a failure at 9,289 ft. in the Travis Peak after having had only slight shows. Another failure is the Lone Star Producing Co. 1 Murchison & Wofford, J. Tidwell Survey, second test in the LaRue Rodessa pool of northern Henderson County. It was drilled to 8,912 ft. It failed to establish commercial production from the Rodessa.

In southern Hopkins County, Delta Drilling Co. will drill a 9,000-ft. wildcat to the Travis Peak. It is 1 Hendrick, in the northwest part of the Nacogdoches County School Land Survey, 2 miles southeast of Reilly Springs. E. H. Robertson has staked 1 Wilson, an 8,500-ft. wildcat in the Carlo area of Leon County. It is 660 ft. from the northwest and 2,930 ft. from the northeast line of the East Chandler Survey.

Humble 1 Bateman, J. Salinga Survey, offsetting the discovery in the Myrtle Springs pool of Van Zandt County, made some oil on a drill-stem test from 8,450-65 ft., and is now swabbing. J. L. Collins & Co. 1 R. R. Greenlee, Robt. Carodine Survey, a wildcat 3 miles east of Eureka in Navarro County, is dry at 7,510 ft. after reporting a slight show. Travis Peak was topped at 7,012 ft.

The Carthage field, Panola County, had four completions this week, while the New Hope field, Franklin County, had two. The Carthage field reported nine new locations.

**EASTERN TEXAS WILDCAT FAILURES**

Cherokee County: Humble 1 S. H. Maness, Jose Maria Musquez Sur. A-37, 8½ mi. E Rusk, elev. 346 ft., dry in Travis Peak, TD 9,289 ft.

Rusk County: A. F. McMillian and M. Nathan 1 M. & R. Kangera, Thompson Wood Sur., 8 mi. NW Laneville, elev. 392 ft., Nacatoch 2,644 ft., Austin chalk 3,877 ft., dry, TD 4,050 ft.

## LA.-ARK.

### Possible Major Pool Looms in Delhi Area

SHREVEPORT.—R. J. Caraway 1 Bryant, SE NW 35-17n-8e, Richland Parish, cored oil sand at 3,069-73 ft. and 3,147-67 ft., recovering saturated sand with no indication of water. This test is almost exactly half way between the original Delhi field and the Big Creek field opened in July. It appears likely to connect with both, giving one pool 8½ miles long by 1½ miles wide. As the pool is a stratigraphic trap along a buried shore line it appears to be still wide open at both east and west ends.

Twenty new locations have been announced for North Louisiana this week, with one wildcat each scheduled for Franklin and DeSoto parishes. There were four completions in Delhi this week, two producers and two dry holes. The producers were rated at 363 bbl. and 324 bbl., respectively.

**NORTH LOUISIANA SUCCESSFUL WILDCAT**

Claiborne Parish: New gas pool—Hunt 1 Owens, NE SE 15-23n-7w, 2,500,000 cu. ft. gas from pay zone at 4,126-50 ft., TD 5,520 ft.

**NORTH LOUISIANA WILDCAT FAILURE**

Natchitoches Parish: E. H. Demetrie 1 Prudential Insurance, 21 ft. north and 260 ft. west of center of 23-10n-9w, dry, TD 1,840 ft.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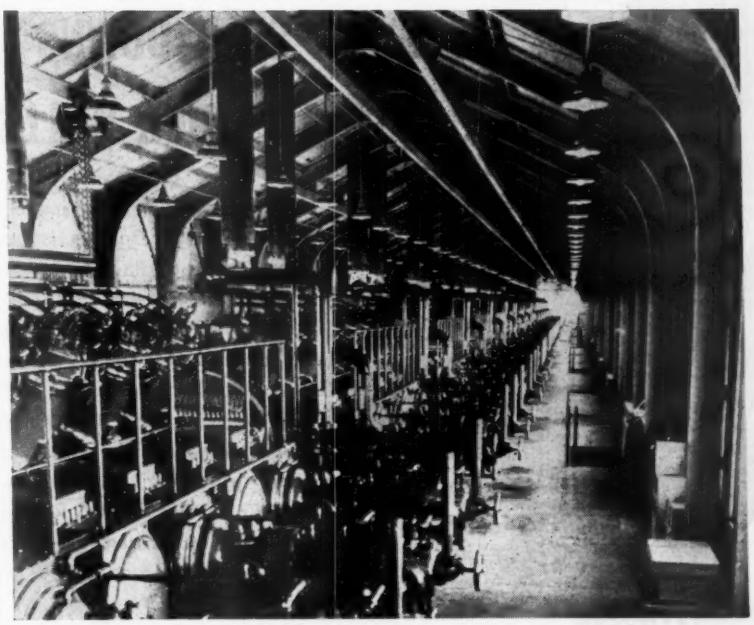

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## SOUTHWEST TEXAS

### Southland Field Gets 196-Bbl. Well

CORPUS CHRISTI. — Hiawatha Oil & Gas Co. completed 38 Southland Life Insurance Co., in the Southland field, Duval County, for an initial production of 196 bbl. of 40° gravity oil per day, choke open, 15 per cent water, gas-oil ratio 954 to 1. Production is from perforations in sand topped at 3,996 ft. Total depth is 4,889 ft., with 5½-in. casing set at 4,073 ft.

R. F. Schoolfield failed to get a producer in the 2 Rosa G. Palacios, a test of the lower sands, in the Randado field, Jim Hogg County. Sand with a slight odor was cored at 2,750-68 ft. On a 1-hour drill-stem test at 2,753-65 ft., one stand of salt water was recovered and the well was abandoned at total depth of 2,803 ft.

The South Texas Geological Society has announced the name "Rachal" has been given the field discovered by Humble Oil & Refining Co. 1 B. A. Skipper, Jr., La Encantada Grant, 1 mile northwest of Rachal, in Brooks County. The society also announced that the Magnolia Petroleum-Abercrombie 1 Dohe, gas-condensate well in center of Block 6, Section 5, Carricitos Grant, Willacy County, is designated as being in the "La Sal Vieja" field, previously discovered by Shell Oil Co., Inc. 1 Yturria Land & Cattle Co., which has been abandoned.

There were 30 new locations reported this week, with 3 being wildcats, 1 each in Bee, Duval and Jim Hogg counties. Of the 29 completions 5 are wildcats, 1 shut-in gas well in San Patricio County, 4 dry holes, 1 each in Bee, Brooks, Webb, and Zapata counties.


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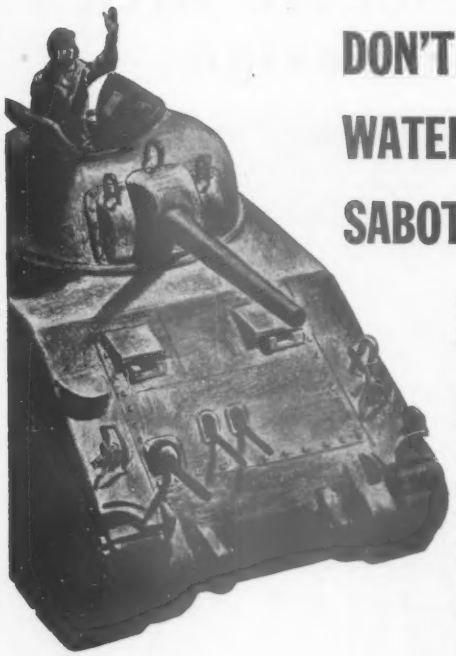

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**SOUTHWEST TEXAS SUCCESSFUL WILDCAT**

San Patricio County: New gas pool—Republic Natural Gas 1 J. B. Hardwick, Welder & Odem Subdivision, Block 48, 3 miles northwest of Odem, TD 6,992 ft., PT gas well, shut in.

**SOUTHWEST TEXAS WILDCAT FAILURES**

Bee County: Bridwell Oil Co. 4 Geo. A. Ray, Anna Burk Survey, Abstract 5, 2 miles east of Beeville, dry at 4,035 ft.

Brooks County: Parker & McClune 1 L. G. Denman, Jose Marcello Ynojosa Grant, Section 78, Block 2, Copita Farm & Garden Tract, 15 miles east of Hebbronville, dry at 5,510 ft.

Webb County: Sid Katz 1 A. M. Bruni Estate, Survey 118, 9 miles south of Bruni, dry at 1,864 ft.

Zapata County: George H. Echols 3 Herlinda T. de Volpe Estate, Porcion 32, Block 60, 14 miles northeast of Zapata, in Cinco de Mayo area, dry at 2,039 ft.

## KANSAS

### Atherton Pool Extended Southeast by Lindas

JOHN LINDAS ET AL 1 Mills, NE SE NE 25-13-15w, in Russell County, has extended the Atherton pool ½ mile east and ½ mile south. The well pumped 70 bbl. of oil in 12 hours from the Arbuckle, with tops reported as Lansing 3,035 ft., and Arbuckle 3,310 ft. Total depth of the hole is 3,315 ft. New drilling activity for this area is expected as a result of the extension.

The new pool opener for Sedgwick County, British-American Oil Co. 2 Petrie, NW SW SW 36-26-1w, has been assigned a potential of 417 bbl. per day from the Simpson. British-American has staked a location for 3 Petrie, in NW NW SW 36-26-1w, a 40-acre offset to the discovery well.

In Thomas County, The Texas Co. 1 McArthur, SE NE SW 18-8-36w, a rank wildcat about 20 miles east of Goodland gas field, is taking a drill-stem test. Mississippi lime was topped at 4,896 ft., and a small show of oil was encountered at 4,960-70 ft.

Continental Oil Co. 1 Brown, NE NE NE 33-3-27w, a rank wildcat test in Decatur County, swabbed 7 bbl. of oil in 1 hour after acid. Six-inch pipe was set at 3,767 ft. and perforations were made at 3,610-3,722 ft. in the Lansing.

**KANSAS SUCCESSFUL WILDCATS**

Barton County: New Oil Pool, Unruh—Harber et al 1 Unruh, NE NE NW 24-20-15w, flowed 10 bbl. per hour through ¼-in. choke from Arbuckle at 3,644-46 ft., TD 3,690 ft., Simpson 3,557 ft., Arbuckle 3,566 ft.

Sedgwick County: New Oil Pool—George Fuller et al 1 Ternes est., NW NW SW 22-27-1w, 50 bbl. from Kansas City at 2,779-2,828 ft., TD 2,828 ft., Kansas City 2,680 ft.

**KANSAS WILDCAT FAILURES**

Ellis County: Stearns & Vernon 1 Froelick, NE NE NE 3-13-16w, dry, TD 3,650 ft., Arbuckle 3,637 ft.

Leavenworth County: Sloan & Zook 1 Hall, NW NW NW 15-12-20e, dry, TD 1,214 ft., Mississippi lime 1,210 ft.

McPherson County: Galva Oil & Gas 1 Borth, NW SW SW 29-19-2w, dry, TD 3,640 ft., Arbuckle 3,604 ft.

Morton County: Stanolind 1 Heiken-Fortenbaugh, center of 19-32-40w, dry, TD 2,617 ft.

Reno County: H. A. Hershfield 1 Jones, SW SW SW 32-22-10w, dry, TD 3,742 ft., Arbuckle 3,692 ft.

Rice County: Bridgeport 1 Deal "B," NE

NE NW 31-18-6w, dry, TD 3,508 ft., Arbuckle 3,454 ft.

**MISSOURI WILDCAT FAILURE**

Atchison County: Dan Short 1 Rankin, SE SE SE 9-65n-40w, dry, TD 1,384 ft.

**NEBRASKA WILDCAT FAILURES**

Dawes County: Amerada 1 State, NE SE 16-33n-40w, dry, TD 4,494 ft.

Gage County: Dan Kees 1 Terry, S/2 SW 27-5n-6e, dry, TD 2,528 ft., Granite 2,524 ft.

# SOUTH LOUISIANA

## So. Jeanerette Discovery Flows 211 Bbl. in Test

NEW ORLEANS.—Atlantic Refining Co. 1 Blanchard, 37-13s-9e, the discovery well of the South Jeanerette field in St. Mary Parish, flowed a potential of 211 bbl. daily through a 1/8-in. choke, gas-oil ratio 478 to 1, gravity 34.6, from 24 perforations at 7,476-84 ft. Total depth is 8,159 ft., with 5½-in. casing set to 8,157 ft.

Humble Oil & Refining Co. 1-B Bel, wildcat in the Oberlin area of Allen Parish, recovered 90 ft. of mud with 21 ft. of sand on drill-stem test from 9,415-22 ft. Ran drill-stem test from 9,417-24 ft., and packer slipped, as on two previous tests in this zone, and the recovery was 400 ft. of gas-cut mud. Operators are now drilling at 9,573 ft. in shale and hard sand.

The Louisiana Conservation Department has set Louisiana allowable, effective September 1, 1945, at 403,940 bbl. per day, or a decrease of 4,758 bbl. daily. South Louisiana gets 323,781 bbl. per day, down 5,492 bbl.; and north Louisiana gets 80,159 bbl., up 734 bbl. per day.

Only five new locations were reported this week for the south Louisiana district, one being a wildcat in Cameron Parish. Of the 7 completions this week, three are producers and four dry. One of these dry holes is a wildcat in Beauregard Parish.

**SOUTH LOUISIANA WILDCAT FAILURE**

Beauregard Parish: Magnolia 1 Lutcher-Moore Lumber Co. "D", 34-5s-12w, dry, TD 8,060 ft.

# CANADIAN FIELDS

## Turner Valley Extension Gets 772 Bbl. Per Day

CHATHAM.—In the Turner Valley north extension, Foothills Oil & Gas Co. 21, LSD 10, 4-21-3w5, has finished with initial production of 772 bbl. from Madison limestone at 8,047-8,448 ft.

**Conrad.**—In the Conrad field, southern Alberta, Conrad-Province 35-5-A, LSD 10, 5-6-15w4, TD 3,077 ft., is on the pump, making 70 bbl. daily. Conrad-Province 75-25-D, NW¼ 25-5-16w4, TD 3,281 ft., is dry. The latter location was southwest of production. Conrad-Province 35-32-B, LSD 10, 32-5-15w4, to the south, is dry below 3,102 ft. Three wells are testing and one drilling.

**Hay Lake dome.**—Admiral Oils and British Dominion of Calgary are starting a wildcat test on the Hay Lake dome, about 3 miles north of the Montana boundary, in LSD 7, 22-1-17w4. Location is west of the former Red Coulee field, on acreage where extensive seismographic work has been done.

# TEXAS GULF COAST

## Wilcox Condensate Show 4 Miles North of Chapel Hill

HOUSTON.—Rutledge & Clark 1 Stzelecki, wildcat in E. R. Miller Survey, about 4 miles north of Chapel Hill in Washington County, is reported to have encountered shows of gas and straw-colored condensate, or high-gravity oil, in a sand at the 7,000-ft. level in the Wilcox zone. Total depth of the hole is 7,501 ft. Electric log was run to bottom and sidewall samples are being taken in zones indicating possible sand on the log. Some shows were reported in the section between 6,690-6,702 ft. and from 7,000-17 ft.

A major eastward extension to the Pinehurst field is assured at the Pan American Production Co. 1 J. M. Winslow heirs, in Edwin Allard Survey, and 5,425 ft. northeast of its 1 Posey, producer at Pinehurst field, Montgomery County. This test is 8,700 ft. southwesterly from nearest production in the Lake Creek field. Total depth is 11,145 ft., with 5½-in. casing set to 11,143 ft. Pipe was perforated at 10,985-11,005 ft. and on a drill-stem test it flowed gas-condensate with 1,100 lb. working pressure, no water. Bridge plug was set and new perforations made at 10,325-345 ft. where it is now testing for dual completion with the lower sand.

Cities Service Oil Co. 1 John Schobal, in James Tumlinson League, northeasterly extension to the Columbus field in Colorado County, is trying for completion as an oil well in the 7,850-ft. sand. The


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well had previously shown gas-condensate production at 8,100 ft., 8,300 ft., 8,500 ft., and 8,800 ft. On drill-stem tests through perforations 7,859-63 ft., the well tested oil and salt water. Operators will try to complete a little higher in this sand.

Houston Drilling Corp. 1 Adolph H. Miller, a wildcat 8 miles west of Edna, in M. Marquez Survey, Abstract 49, Jackson County, was abandoned at total depth of 5,507 ft.

E. I. Thompson and Joseph T. Heydon 1 Texas Long Leaf Lumber Co., a wildcat in Walker County School Land Survey, Abstract 494, 3 miles northwest of Splendora, in Montgomery County, was abandoned at a total depth of 6,036 ft. Electric log was run to this level, which indicated a sand around 5,902 ft. but sidewall samples failed to reveal any shows.

General Crude Oil Co. 1 G. C. Mattauer, a wildcat shallow test in G&BN Survey, Abstract 311, about 5 miles east of Rockland, Tyler County, has been abandoned at total depth of 3,515 ft., with no shows reported.

Twelve new locations were reported this week, 4 wildcats, 1 each in Brazoria and Jackson counties, and 2 in Fort Bend County. Of the 15 completions, 9 were oil and 2 gas, with 4 dry holes. Brazoria and Wharton counties each had 3 completions.

### UPPER GULF COAST SUCCESSFUL WILDCATS

Jefferson County: Gas-condensate discovery, Gilbert Ranch area—Sun Oil 1 Gilbert Estate, John Ricord Survey, Abstract 189, 7 miles south of China, TD 8,996 ft., perforations, 56 holes, 8,675-90 ft., PT gas-condensate well, no gage, shut in.

Wharton County: Extension to Daboval field—Humble 1 F. T. Reitz et al, W. D. Ivey Survey, Abstract 517, 5½ miles Southwest of El Campo, total depth 7,227 ft., PT 61,000,000 cu. ft. gas, open flow, 11 bbl. condensate per million, tubing pressure 2,460 lb., casing pressure 2,550 lb., gravity 61°.

Wharton County: North flank discovery Boling field—Union Oil 1 Estate of E. Hawes and L. M. R. Hawes, John Huff League, Abstract 31, 1 mile northwest of Iago, TD 4,693 ft., top sand 4,550 ft., perforations, 71 holes, 4,550-70 ft., PT 156 bbl. per day through 3/16-in. choke, gas-oil ratio 300 to 1, tubing pressure 320 lb., casing pressure 420 lb., gravity 25°, no water.

### UPPER GULF COAST WILDCAT FAILURES

Jackson County: Houston Drilling Corp. 1 Adolph H. Miller, M. Marquez Survey, Abstract 49, 8 miles west of Edna, dry, TD 5,507 ft.

Montgomery County: E. I. Thompson and Joseph T. Heydon 1 Texas Long Leaf Lumber Co., Walker County School Land Survey, Abstract 494, 3 miles northwest of Splendora, dry, TD 6,036 ft.

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## CALIFORNIA

### 3 Potential Pool Openers In Los Angeles Basin

LOS ANGELES.—California may soon have three new oil fields as three wildcats in the Los Angeles Basin prepared to test. The wildcats are Ohio's Gardena in 24-3s-14w; Standard's Leffingwell in 11-3s-11w; and Richfield's U. P. Unit in the Bandina area, 9-2s-12w.

Ohio has secured a water shutoff on 7-in. casing cemented at 10,350 ft. and is preparing to make an immediate production test. This well looked very good on a formation test last week. Complete data has been withheld but will be released after the well is finished.

Standard's 1 Lewis Community at Leffingwell is another "tight hole", which is being prepared for production. Bottom of the hole is 10,292 ft. and 7-in. casing has been cemented at 10,166 ft.

The most significant thing about these two wildcats is the depth at which drilling has been concluded. Ohio's wildcat was drilled to 10,594 ft. and the showing was found in the bottom of the hole. This test is located about 2 miles west of the Dominguez field and if the Dominguez axis was projected it would pass within a short distance of Ohio's location. Standard's Leffingwell test is located about midway between Santa Fe Springs and the West Coyote field and would fall within a short distance of a projected extension of the Santa Fe Springs axis. It is thought that the pay in each well was found in rocks of Miocene age.

Richfield's wildcat in the Bandini area is temporarily held up by mechanical trouble at 8,496 ft. This is another "tight hole", but the value of leases in the general area indicate that the limited data available may be about right. There are several large parcels unleased in the area and the offerings are on the basis of proved production instead of unproved land.

A fourth wildcat that has shown some favorable indications from time to time is Tide Water Associated's Cantua test in Fresno County, now drilling in shale possibly Eocene age at 12,000 ft. This test showed considerable gas pressure higher up in the hole. Since then several showings have been logged but were not deemed worth testing.

Of the four wildcats, it is felt that Standard's Leffingwell wildcat offers the

most hope of large production. If this deep drilling proves successful, most other prospecting work in Los Angeles Basin can be disregarded, because the holes were not carried deep enough.

California completions were slightly less than normal this week but this is only temporary. It is probable, however, that completions during the latter part of the year may taper off especially in high-cost fields where operators have been drilling to meet war demand. New locations were normal with 26 locations in the San Joaquin Valley, 10 in the Coastal district, 7 in Los Angeles Basin and 2 locations in wildcat territory.

**CALIFORNIA WILDCAT FAILURES**

Kern County, Tejon: Richfield 15-31 Tejon D, 31-12n-18w, bottomed in hard gray sand, Santa Margarita sand of Miocene age 3,145 ft., small oil showing 4,733 ft., TD 5,821 ft.

Santa Barbara County, Los Alamos: Whittier Associates 2 G. Buell, 23-7n-32w, bottomed in barren gray sand, no showings, TD 995 ft.

# PERMIAN BASIN

## Andrews Co. Ellenburger Test Flows 60 Bbl. Per Hour

MIDLAND.—Shell Oil-Texas Co. 1 Ratliff & Bedford, Section 4, Block 73, PSL, Andrews County, a discovery scheduled to be dually completed from the Devonian and Ellenburger, flowed 60 bbl. of oil during the last hour of an 8-hour natural gage from Ellenburger at 11,168-180 ft., with only one per cent drilling mud cut and no water. Later the 5½-in. casing was perforated with 1,168 shots from 11,018-11,310 ft. When swabbed, the well kicked off and was flowing into pits to clean itself. No estimate of the production was reported.

Fullerton Oil Co. 9-A H. Wilson, Section 16, Block A-32, PSL, Ordovician test in the Fullerton area or Andrews County, on a 1-hour drill-stem test from 7,255-7,360 ft. recovered 2,950 ft. of oil-cut mud, 2,700 ft. of oil and 1,600 ft. of sulfur water. Magnolia Petroleum Co. has staked an 11,000-ft. Ellenburger wildcat in west central Andrews County. It is 2 Jos. Martin, 660 ft. from the south and west lines of Section 12, Block A-47, PSL. The test is 10,050 ft. southwest of Magnolia 1 Martin, recent failure at 10,118 ft. in Devonian lime.

**Ector County.**—Stanolind Oil & Gas Co. and Landreth Production Co. 3-Q Scharbauer, Section 12, Block A, Public School Land Survey, prospective discovery from both the Clear Fork and Wichita Albany, at the north end of the Goldsmith pool, ran a 1-hour drill-stem test from 7,501-63 ft. Recovery was 30 ft. of 39° gravity clean oil and 335 ft. of oil and gas-cut mud. Elevation is 3,159 ft. On a core from 7,574-89 ft., 14 ft. of silty dolomite with no shows was recovered. Operator was coring ahead. Stanolind 1 Williamson (Cole), Section 5, Block 45, T-1-N, T&P Survey, an Ordivician wildcat 15 miles northwest of the Goldsmith pool, recovered 120 ft. of heavily gas-cut drilling mud on a drill-stem test from 4,373-4,424 ft. in the San Andres. There was a good blow of air throughout. Operator was preparing to run another drill-stem test from 4,463 ft. in lime. Skelly Oil Co. 1 TXL, northwest offset to Roman Drilling Co. 1 TXL, southeast extension to the TXL pool, was completed for 795 bbl. of 38° gravity oil through perforations from 7,830-7,981 ft.

In northwest Loving County, 17 miles northwest of Wink, Argo Oil Corp. has staked an important test, 1 Evalyn Lineberry, 1,980 ft. from the south and west lines of Section 13, Block 75, PSL. It is planned to drill to 6,000 ft. Seaboard Oil Co. of Delaware will drill a 5,500-ft. wildcat in Upton County. It is Amacker-Halff estate, 1,618 ft. from the north line and 4,655 ft. from the west line of Section 87, Block D, CCSD&RGNG Survey, 15 miles northwest of Rankin.

Sand Hills Tubb field, Crane County, and Westbrook field, Mitchell County, each had two field completions this week. Fullerton field, Andrews County, had six new locations, while Keystone-Ellenburger field, Winkler County, had five, TXL pool, Ector County, had four and Wasson field, Yoakum County, had three.

**WEST TEXAS SUCCESSFUL WILDCAT**

Ward County: New oil pay—Shell 6 Sealy-Smith, Sec. 37, Blk. A, G&MMB&A Sur., Monahans pool, plugged back to 5,040 ft., flowed 481 bbl. day through ½-in. choke on 2-in. tubing, perf. 4,730-5,020 ft. Holt, gravity 37°, gas-oil ratio 910, TD 8,058 ft.

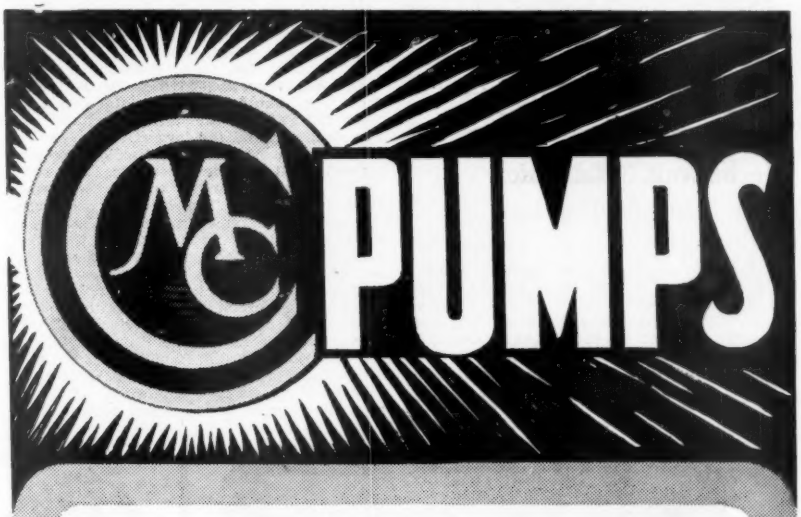
**WEST TEXAS WILDCAT FAILURES**

Pecos County: Phillips 1 Powell (Powe), Sec. 3, TMRR Co. Sur., elev. 2,917 ft., 3½ mi. W and N Fort Stockton field, dry, TD 12,127 ft.

Presidio County: Stanolind 1 Presidio Trust, Sec. 99, Blk. 3, D&PRR Sur., 50 mi. S Van Horn, elev. 3,894 ft., Buda 2,670 ft., dry, TD 5,005 ft.

**SOUTHEASTERN NEW MEXICO**

HOBBS.—Neville G. Penrose, Inc., 1 Federal-fee, 9-22s-37e, 14 miles north of Hobbs, second Ellenburger discovery in Lea County, flowed 853 bbl. of 41° gravity oil in 29 hours through perforations from 8,100-40 ft. Operator is new testing section from 8,060-8,100 ft. One-fourth mile west of 1 Federal-Penrose, another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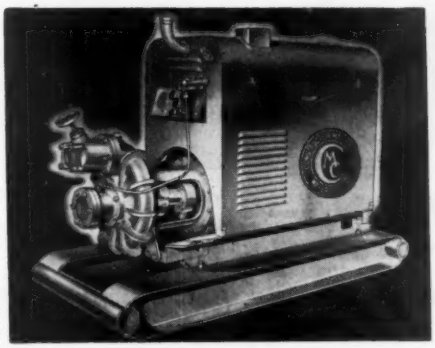

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deep test will be drilled by Neville G. Penrose. It is 2 Federal-fee, 9-22s-37e. Another offset will be Rowan Drilling Co. 9-B Federal-Penrose, diagonally northwest of the discovery. Phillips Petroleum Co. 1 Sims, 24-22s-37e, on the north side of the Drinkard area, was plugged back to 6,614 ft. It was acidized with 1,500 gal. and after oil load and acid residue was cleaned out, swabbed 1⅛ bbl. of oil per hour.

Six miles south of the north line and 14 miles west of the east line of Eddy County, Forest E. Levers has staked 1-B Levers, 1,980 ft. from the north line and 660 ft. from the east line of 34-16s-29e. Another new wildcat for northeastern Eddy is A. J. Hardendorf 2 State, 330 ft. from the south and west line of 36-18s-30e. It is 18 miles south and 7 miles west of the northeast corner of the county.

Eddy County had two field completions and Lea County had one. The Grayburg-Jackson field, Eddy County, and the Paddock field, Lea County, each had two new locations.

## ROCKY MOUNTAIN

### Important Extension For Rangely Field

DENVER.—An important extension of Rangely field, Rio Blanco County, Colorado, is imminent in Wasatch Oil Refining Co.-Newton Oil Co. 2-D Gentry, CSL SW NE 3-1n-102w, ¾ mile south and a little west of Stanolind Oil & Gas Co. 1 Rector, the nearest producer. It had the top of the Weber at 5,712 ft., on datum of —503 ft., and was drilled to 6,371 ft. While swabbing and washing out the sand it started flowing and gives every indication of being a good well. The significance of the extension lies in the apparent flattening of the beds on the southeast and the topping of the Weber higher than was expected. The Gentry well appears to be only 259 ft. lower than the discovery, and indicates the productive area may extend some distance beyond this location.

**High-gravity oil at Sheldon.**—The discovery in the Embar formation reported last week in Phillips Petroleum Co. et al 1 Shoshone, NE NE 16-5n-2w, Sheldon dome, Fremont County, Wyoming, was shut in for tankage after flowing 200 bbl. in 4 hours. Tankage is being erected and a flow test will be made in a few days. Three zones in the Embar remain to be tested. First reports of the high gravity of the oil are confirmed and showed 36.4 degrees at 59° F. This is much higher than generally found in that formation in Wyoming. Preliminary tests indicated little or no sulfur content.

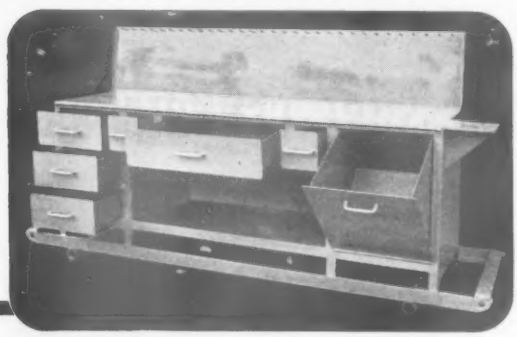
**Big well at Crook's Gap.**—Sinclair-Wyoming Oil Co. 4 Unit, NW NW SW 18-28n-92w, Crook's Gap field, Fremont County, Wyoming, flowed 3,817 bbl. in 24 hours from the Lakota sand at a total depth of 5,088 ft. This is the third producer on the structure and the largest of the three. It is a south offset to the discovery which flowed 1,478 bbl. in 24 hours. The second well, a west offset to the discovery, flowed 2,687 bbl. The original well was intended as a Tensleep test, but stopped after finding big production in the Lakota. The Tensleep has not been explored.

**Water in Shiprock test.**—Continental Oil Co. 1 Shiprock, 5 miles south of the Rattlesnake pool, San Juan County, New Mexico, and close to the Shiprock dyke, on unsurveyed land, which was drilled to explore the possibility of a fault closure at that location, topped the Dakota at 1,340 ft. and encountered water. The hole will be cased and Lakota tested before making it into a water well to be turned over to the Navajo Indians.

**New operations.**—Seventeen new operations were reported in the Rocky Mountain area, of which 1 was in Colorado, 7 in Wyoming, 5 in Montana and 4 in Utah. Six of these were wildcats. Four of the wildcats are in Utah where an extensive play is under way. One of the most interesting is W. S. McCarthy 1 State, C NE NW 16-22s-19e, Salt Valley anticline, Grand County, which is drilling at 1,000 ft. It is located 1¼ miles south of Mack Drilling Co. 1 Reeder drilled late in 1942 by Defense Plant Corp. for the Potash Co. of America to explore the potash and magnesium beds in that area. The Reeder well went to 4,207 ft. and had shows of oil and gas in the Pennsylvanian, in the Dakota sand at 1,770-1,807 ft., and in the Morrison at 1,935-2,019 ft. While these shows subsequently were tested, the results were not made public.

Two of the Utah wildcats are in the Vernal district in Uintah County, south of the Ashley Creek structure which for a number of years produced gas commercially from the Morrison sand. These are Equity Oil Co. 1 Powell, SW NW NW 34-4s-22e, which is drilling at 127 ft., and Merkley & Davidson 1 Mayo, SW SW NW 22-4s-21e, which is spudding. The fourth wildcat is Carbon Dioxide & Chemical Co. 1 Government, NW NW SE 12-15s-11e, Farham dome, Carbon County. This is near a Weber sand test being drilled by Mountain Fuel Supply Co. The chemical company has drilled several wells to the carbon dioxide gas sand in the Morrison at 3,100 ft. with which to manufacture dry ice.

The Colorado wildcat is Ohio Oil Co.-Associated Oil Co. 1 Weld County-7, NW SW SW, 1-3n-61w, Wiggins district, Weld County, Colorado, which will test the Sundance below 8,000 ft. It is spudding Husky Refining Co. 1 Taggart, NE NW

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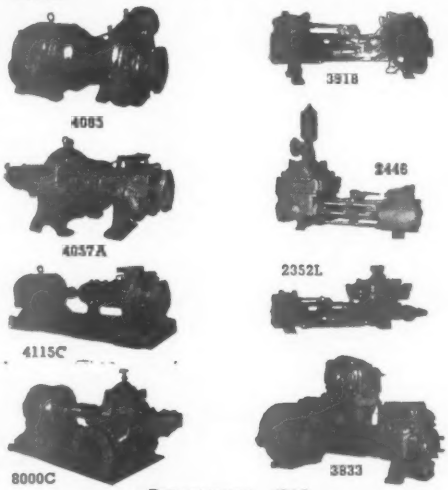


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NE 12-57n-100w, is an extension test in the South Elk Basin field.

Development wells include five in Cut Bank, two in Steamboat Butte and four scattered.

**Completions.** — Nine development wells were completed of which eight were oil wells with an initial production of 4,598 bbl., and one was a gas well for 6,000,000 cu. ft.

# OKLAHOMA

## New Kingfisher Discovery Makes Important Showing

PHILLIPS Petroleum Co., Carter Oil Co. and Kerlyn Oil Co. 1 Girick, a Kingfisher County, Oklahoma, pool opener, mentioned last week, flowed 629 bbl. in a 24-hour test, through 10/22-in. choke. Previously it made 301 bbl. in 9 hours through 10/32-in. choke on tubing. This well, in C SW SW 26-16n-5w, was bottomed at 7,390 ft. and plugged back and casing set at 7,152 ft. Hunton lime was topped at 7,065 ft. and pipe was perforated in the upper portion of the Hunton. The well is 5 mi. north of the West Edmond field.

The old Paden district in Okfuskee County has a prospective new pool. J. E. Crosbie, Inc., and Warren Petroleum Co. 1 Novotny, NE SE SW 20-12-7, was drilled to 3,844 ft. Pipe was set at 3,832 ft. After several head flows into pits the well made 30-bbl. of oil in 21 minutes but caving hole stopped the flow. It was given a shot and flowed 31 bbl. per hour.

George F. Martin et al 1 L. B. Jackson, SE NE NW 1-14-10, eastern Creek County, is a good Dutcher sand well in an area in which there are Wilcox sand dry holes. The well produced 238 bbl. the first 24 hours and 280 bbl. on Saturday from Dutcher formation at 2,470-86 ft. The Glenn or Bartlesville sand was found at 2,160-75 ft. at which latter depth pipe was set. The old Slick pool lies west and southwest of this well.

Gas oil ratios in the West Edmond field in Oklahoma, Kingfisher, Canadian and Logan Counties have increased 200 to 300 ft. of gas to the barrel of oil over the figures of three months ago. It is said that about 80 wells in the field are showing brine cutting. Nearly all these "water wells" are on the west flank of the structure. Phillips Petroleum Co. completed two wells in the field in the past week which are about 14 miles apart. No. 2 Storm in 24-15n-5w was good for 276 bbl. in 12 hours, through choke and No. 2 Halmbacher in 22-13n-4w flowed 311 bbl. in 11 hours through choke.

Out in Cimarron County in the Oklahoma Panhandle, Pure Oil Co. 1 Oklahoma State, SE SE NW 7-5n-8e, Cimarron meridian, was spraying some oil from Cimarron sand at 4,786-4,890 ft. After it was acidized it swabbed 10 bbl. of oil and 6 bbl. of water in 15 hours with gas at the rate of 250,000 cu. ft. of gas per day. Pure has two gas wells and a dry hole on the block which is 90,000 acres in extent.

**OKLAHOMA SUCCESSFUL WILDCATS**

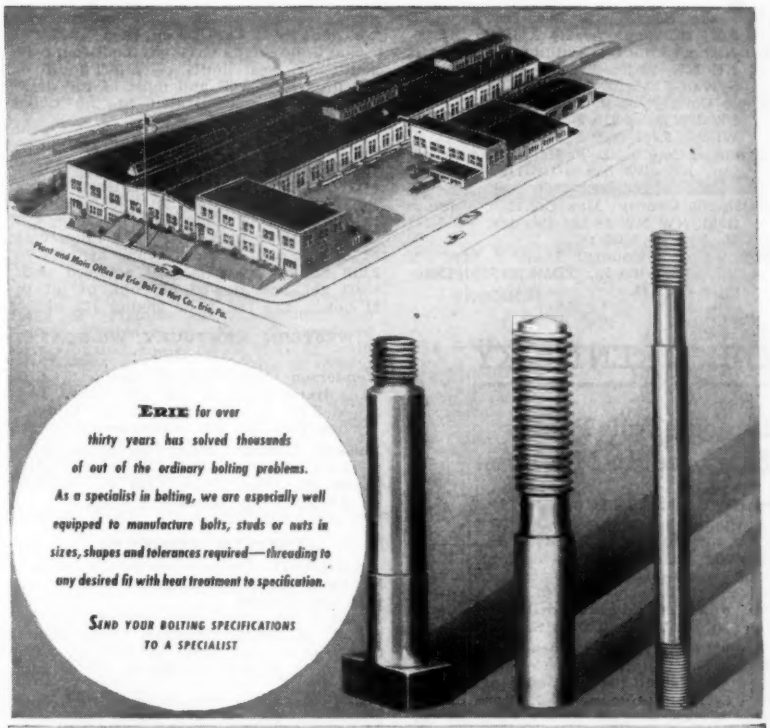
McIntosh County: New Gas Pool—H. C. Swick et al 1 Well, NE SE SW 9-9n-14e, flowed 14,250,000 cu. ft. of gas from Gilcrease at 2,721-33 ft., TD 2,733 ft., Gilcrease 2,718 ft.

Noble County: New Oil Pool—Magnolia 1 Wallard, SW SW SW 34-22n-2w, flowed 193 bbl. through ½-in. choke from Bartlesville at 4,673-88 ft., TD 4,691 ft., Big lime 4,269 ft., Oswego 5,370 ft., Bartlesville 4,678 ft.

**OKLAHOMA WILDCAT FAILURES**

Caddo County: Sinclair-Prairie 1 Hall, NW NW SE 36-7n-13w, dry, TD 6,110 ft., Sycamore 5,086 ft.

Cotton County: Johnson Drilling 1 Bez-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neska, SE SE NW 20-1s-11w, dry, TD 2,681 ft., conglomerate 2,365 ft.

Kingfisher County: Phillips 1 Roffman, NE NW 12-15n-5w, dry, TD 7,336 ft., Sylvan 7,286 ft.

Noble County: J. E. Trigg et al 1 Cottle, SW NW SE 8-21n-2w, dry, TD 5,490 ft., Wilcox 5,405 ft.

Okfuskee County: E. P. Halliburton 1 Wilson, NE SW SW 5-11n-11e, dry, TD 3,092 ft., Cromwell 3,076 ft.

Oklahoma County: Max Cohen 1 Stubblefield, NW NW 14-12n-4w, dry, TD 7,347 ft., Sylvan 7,334 ft.

Pottawatomie County: Texas 1 Lee, NE NE SW 8-10n-5e, TD 4,784 ft., Dolomite 4,762 ft.

# OHIO, KENTUCKY

## Duncan Falls Pool Is Extended ½ Mile East

THE Duncan Falls pool in Muskingum County has been extended ½ mile east by Industrial Gas Co. 1 Myers-Hock, Section 20, Salt Creek Township, Clinton Sand, logged at 4,190-4,224 ft., gaged 2,800,000 cu. ft. natural. East of this pool for five miles considerable drilling is being done for oil in the Medina Sand.

Ohio Fuel Co. 1 J. R. Barnes, Section 29, Ripley Township, Holmes County, an outside offset along the west edge of the Big Prairie pool, came in at 1,070,000 cu. ft. with a rock of 1,020 lb. Pay was in the second Clinton at 3,173-3,207 ft.

Ohio Fuel 1 Katherine Hipp, Lot 92, Hinckley Township, Medina County, found a thick hard sand at 3,262-3,340 ft. with a gage of 560,000 cu. ft. After shot the well was shut in at 1,870,000 cu. ft.

The Columbiana Oriskany pool found its south and west limits 1½ miles south of the discovery well and most of the drilling is now concentrated to the north and east.

### WESTERN KENTUCKY

OWENSBORO, Ky.—The Hitesville pool in Union County has an excellent well in the course of completion in Carter Oil Co. 2 Emil Spencer, 25-P-21, 6 miles east of Uniontown. McClosky lime at 2,496 to 2,618 ft., at intervals, was acidized with 4,000 gal. and flowed 678 bbl. of oil in 21 hours, the last hour gaging 125 bbl.

### WESTERN KENTUCKY WILDCAT FAILURES

Henderson County: R. G. Gould et al 1 Irene Jones, C NW SW 9-P-22, dry at 2,701 ft., Glen Dean 1,934 ft., Barlow 2,200 ft., Ste. Genevieve 2,536 ft.

McLean County: Miller & Shiarella 1 L. C. Hayden, 19-N-27, dry at 2,280-96 ft., Glen Dean 1,730 ft., Barlow 1,915 ft., Ste. Genevieve 2,091 ft.

### EASTERN KENTUCKY

ASHLAND.—Completions in the eastern Kentucky field this week were confined to Knott County.

Inland Gas Corp. completed No. 275 on the H. H. Smith property, Troublesome Creek, at a total depth of 2,879 ft., with daily open flow of 381,000 cu. ft. of gas, white slate.

Kentucky-West Virginia Gas Co. completed No. 5591, on the Joseph Reynolds property, Reynolds Fork of Right Fork of Troublesome Creek, at 3,110 ft., with daily open flow of 119,000 cu. ft. of gas in shale, after shooting.

### INDIANA

EVANSVILLE, Ind.—The Texas Co. opened a new productive spot in Posey County with its 1 J. L. Larkin, NE NE SW 16-6s-14w, in O'Hara lime at 2,811-14 ft. Another wildcat completion was dry as were three field wells in Gibson County.

### SUCCESSFUL WILDCAT IN INDIANA

Posey County: Texas 1 J. L. Larkin, NE NE SW 16-6s-14w, O'Hara lime at 2,811-14 ft., TD 2,981 ft., PB to 2,875 ft., 10 ft. above dry McClosky lime, pumped 48 bbl. the first 24 hrs.

### INDIANA WILDCAT FAILURE

Posey County: Cherry & Kidd 2 Allen Gray estate, SW SE SW 36-7s-15w, dry at 2,892 ft., Cypress sand 2,431 ft., tested 1 bbl. of salt water per hour.

# APPALACHIAN FIELD

## Eastern W. Va. Test Running Low

IN West Virginia, on the Blackwater anticline in Canaan Valley in Dry Fork district, Tucker County, near the Maryland Panhandle, Ohio Oil Co. topped the Corniferous lime at 8,107 ft. and the chert at 8,154 ft. in its wildcat on the Kuykendall Unit. Projecting this to the Oriskany sand, the test is running about 289 ft. lower than the gas well about 1½ miles to the north on the Kaemmerling tract.

In Wood County, West Virginia, L. W. Burdette et al completed a well on Augusta and Ira Bennett farm in Harris


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district, 1.2 miles up stream from where Middle Fork of Lee Creek crosses State Route No. 2. It is showing for 30 bbl. a day from the Berea and may open a new pool. The total depth was 1,936 ft.

In Unity Township, Westmoreland County, southwest Pennsylvania, Railway Steel Spring Division of American Locomotive Works has made a location for an 8,000-ft. Oriskany test on L. C. Steiner 125 acres, 3 miles northeast of Latrobe on the Fayette anticline.

In Nottingham Township, Washington County, Ed Beedle et al are testing the Fifty Foot sand in a test on Minnie McNary farm which filled up 1,000 ft. with oil in an 8-in. hole. This is 3,000 ft. from old production. In East Findley Township, Foley & Williams drilled through the Fourth sand in a test on Cecil Brownlee farm, logging the sand 2,729-47 ft. with about 5 bbl. a day oil showing at 2,729-31 ft. It is drilling at 2,787 ft.

## MICHIGAN

### New Well in Gratiot Co. Revives Old Elba Play

SAGINAW.—Arthur Williams 1 Cook, SW SE SW 14-9n-1w, in Gratiot County, Elba Township, is making 10 bbl. per hour from the Traverse limestone, and is reviving the play made in 1927 when the discovery well was drilled. The 18-year-old discovery well made about 25 bbl. per day, in the days before acidizing the pay. Additional development failed to result in commercial wells, and the play sank into oblivion.

The new Williams 1 Cook well started with 400 ft. of oil in an open hole and production was jumped with 500 gal. of acid to 12 bbl. in 4 hours. Retreated with 1,500 gal., the well is flowing 10 bbl. per hour with pump agitation. The oil tests 43.7 gravity with no water.

The Headquarters oil field area may have a new shallow gas reserve in prospect. E. V. Hilliard D-1 State, E½ SE SE 19-21n-3w, in Roscommon County, drilled into a high volume of Stray sand gas, estimated from 10 to 30 million feet. The pay was logged at 1,323-25 ft., and was drilled with cable tools.

W. C. Taggart 2 Sanford-Rooet, SW 7-18n-4w, has started the new Hatton area of Clare County on the road to a commercial field. The well gaged 10,350,000 cu. ft. of gas from the Stray sand at 1,656 ft. As the first commercial gas well completed in the area, the 2 Sanford-Rooet becomes the discovery.

### "Let's Go Visiting" Marks Drake Well's Birthday

TITUSVILLE, Pa. — Drake Well Memorial Park was featured August 28 in a transcribed radio program, "Let's Go Visiting," carried over several networks and marking the eighty-sixth birthday of the Drake well here. The broadcast presented an interview with Prof. Paul H. Giddens, curator of the park, and professor of history and political science at Allegheny College, on early petroleum history. Howard Peterson, organist, played selections from popular music written about petroleum in 1865. The original sheet music for these numbers is a part of the historical collection at the Drake museum.

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Fig. A-133, Threaded

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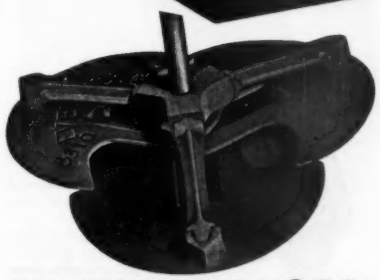

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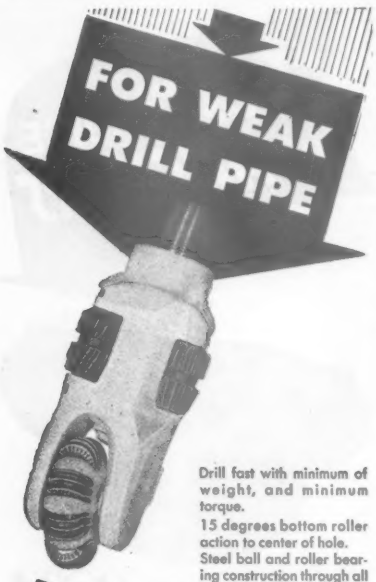


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# Among the Drilling Contractors

**Loffland Brothers Drilling Co.,** Los Angeles drilling contractor, has established an enviable drilling record in California by drilling 10,748 ft. of new hole for Western Gulf Oil Co. in 63-7 Symons at Paloma in exactly 30 days. The usual completion time in this field is from 45 to 60 days depending upon the depth.

**National Drilling Co.,** of Calgary, Alta., has a contract to drill National-Empire 1, LSD 10, 34-19-22w4, a joint test for National Petroleums, Empire Petroleums, and Pacific Petroleums in the Steveville-Princess field, eastern Alberta.

**Muskegon Development Co.** is contractor on the James L. Gallagher and Richard R. Bachelder 1 Clarence and Gladys Sinn, in N½ S½ NE 12-14n-4e, Bay County, Michigan.

**Penrod Drilling Co.** will drill the Gulf Refining Co. 2 Ella G. Lees, in 69-7n-1w, Adams County, Mississippi. Derrick was building. The same contractor was rigging up to start drilling on the Kirby Petroleum Co. E-2 Long Bell Petroleum Co., in SW SE NW 30-1n-18e, Clarke County, Mississippi.

**General Petroleums,** of Calgary, Alta., has completed a succession of large gas wells for Bata Petroleums in the Vera-Unity field of West-Central Saskatchewan. Bata Petroleums 7 has a potential rated at 34,150,000 cu. ft. and Bata 8, LSD 5, 23-29-23w3, at 1,599 ft. has 5,000,000 cu. ft. Locations were made by Dr. J. O. G. Sanderson, consulting geologist of Calgary, and G. G. Mathews, of Denton & Spencer, petroleum engineers of Calgary, was field superintendent.

**John Wilson** has been awarded contract to drill the Eugene Hilliard and Kenneth A. Fox 1 J. Vanderbrink, in SW SE NW 33-16n-3e, Bay County, Michigan.

**Loffland Brothers Co.** are contractors on the California Co. 8 Ella G. Lees, in 29-7n-1w, Adams County, Mississippi. Loffland will also drill for the same company the 7 A. H. Ratcliffe, in 71-7n-1w, Adams County.

**J. W. Sorrels** has been awarded drilling contracts on two tests which will be drilled by W. J. Green, of Wichita Falls, in Tom Green and Coke counties, Texas. The first wildcat, due to start within 60 days, will


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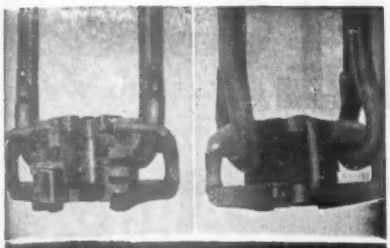

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By incorporating a newly devised roller type balancing cam in BJ "AA" Elevators the work of the derrick man is made much easier. Rated at 300 tons, with a safety factor of four to one, this elevator is made of high alloy steel—fully heat treated—flame hardened on the top bore to minimize upsetting—and is equipped with an unusually sturdy latch. Ask the BJ man or your supplier.

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be in Coke County on Bob Mims' ranch, in the southeast quarter of Section 300, Block 2, H. & T. C. Survey, 11 miles north and slightly west of Water Valley. The second exploration will be on a 40,000-acre Tom Green County block, on a site northeast of Carlsbad. The tests are scheduled to go to the Ellenburger, expected around 8,000 ft.

**W. C. Taggert** has contracts to drill five tests in Mecosta County, Michigan, for Michigan Consolidated Gas Co.

**Northern Development Co.,** of Edmonton, Alta., has contract to drill Kitscoty 1, LSD 4, 36-50-5w4, in the Kitscoty district of northern Alberta for the North Peace Syndicate of Brownvale, Alta.

**Patrick & Tyrrell Drilling Co.** will drill the Gulf Refining Co. 1 B. M. Stevens, in SE NW 28-5n-10w, Perry County, Mississippi. Roads to the locations have been completed.

**Turner Drilling Co.** has been awarded contract to drill the Cities Service Oil Co. 1 John Kotke, in SE NE SE 23-15n-9w, Mecosta County, Michigan.

**Hartman & Jordon,** Mount Vernon, Ill., will be the drilling contractors on the Carter Oil Co. 1 Wilburt Ashworth, in SW NE 14-7s-14w, Posey County, Indiana.

**Charles Coy,** drilling contractor of Lafayette, Ind., will drill the Walter Egelske 1 fee, in SW NE 9-36n-5w, in Porter County, Indiana.

**Lupher Drilling Co.** will drill on contract the Sohio Petroleum Co. 1 Sherman F. Harper, in C N½ NW NW 34-16n-6w, Isabella County, Ohio.

**C. B. Miller** has the contract to drill the Homer Fulton 1 Fron, in SW SW SE 18-1s-12w, Kalamazoo County, Michigan.

# CALENDAR

**October**

American Association of Oil Well Drilling Contractors, Oklahoma City, October 1-2.

Texas Mid-Continent Oil and Gas Association, Rice Hotel, Houston, October 4-6.

I.P.A.A., annual membership meeting. Tulsa. October 15. 16 and 17.

American Gas Association, annual meeting, Engineering Societies Building, New York, October 24.

**1946**

**April**

Natural Gasoline Association of America, annual convention, Baker Hotel, Dallas, April 17-19.


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For oil field, locomotive type and marine boilers. Water shows black—steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

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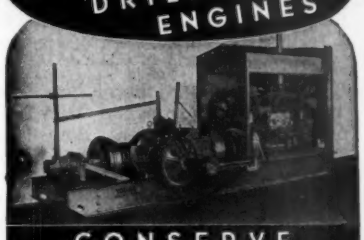

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# PERSONALS

## Now Chairman of Manufacturing Committee

C. S. TEITSWORTH, recently named chairman of the manufacturing committee of Socony-Vacuum Oil Co., has been associated with that organization and its affiliates 19 years. Before going to the New York office in 1934 he served General Petroleum Corp. in Los Angeles for 8 years as supervisor of process laboratories.

Before joining General Petroleum in 1926 Teitsworth had been employed by American Potash & Chemical Co., Fixed Nitrogen Research Laboratory of the War Department, Celite Co., and Dicalite Co. At the time of his transfer to New York his specific assignment was to evaluate the commercial possibilities of catalytic cracking in Socony-Vacuum's refineries. He has been in intimate touch with the development and commercialization of catalytic cracking since then, and he is a director of Houdry Process Corp. In 1936, he was appointed to Socony-Vacuum's manufacturing committee as manager of the company's midwestern refineries, and during the past 5 years he served as vice chairman.

Teitsworth is a graduate of Stanford University, with a degree in chemical engineering, and he did graduate work at University of Minnesota and California Institute of Technology.

**R. L. Saunders,** vice president and secretary of The Texas Co., will head the domestic sales organization as vice president, succeeding **H. W. Dodge,** who resigned to enter private business. Saunders has resigned as secretary. **Walter Hochuli,** formerly sales manager in the company's central territory, has been appointed general sales manager.

**A. Norcott,** field manager for International Petroleum Co. at Talara, Peru, has returned to his office after a 2-month business and vacation trip to Canada and the United States. He visited his former home in Little Rock, Ark.

**Roy O. Wegfors,** who joined Signal Oil & Gas Co., Los Angeles, as a tax accountant in 1936, has been elected treasurer. **S. J. Fox,** who joined the company in 1932, has been appointed comptroller.

**Col. Carl E. Cummings,** who was supervisor in charge of the engineering research department of The Texas Co.'s Beacon, N. Y., laboratory when he obtained military leave of absence in 1941, has been named to succeed Allan V. Ritchie, deceased, as superintendent of the laboratory.

**Frank Bascom,** Hobbs, N. M., has been named superintendent for The Ohio Oil Co. in the Yates field of Pecos County. He succeeds **Frank Redick,** who retired and moved to Spencerville, Ohio.

**Harris Underwood, Jr.,** formerly chief petroleum engineer for J. S. Abercrombie Co., Houston, has become a partner in Texas State Drilling Co. in that city.

**John M. Ware,** Tulsa, has resigned as assistant manager of exploration for Deep Rock Oil Corp. to open an office as geological consultant. He had been with Deep Rock 10 years.

**Charles H. Cole,** assistant manager of Colonial Beacon Oil Co.'s Everett, Mass., refinery, will serve as manager during the absence of **Paul C. Shea,** who has been assigned to The Carter Oil Co. on a loan basis for a year. **Francis J. Powers,** assistant process superintendent and head of the process control department at the Bayonne, N. J., refinery, will assume Cole's regular post during the year.

**W. Fette,** who was assistant maintenance foreman at the Torrance, Calif., butadiene plant of Shell Chemical Co., has been transferred to the Cactus plant as acting general foreman.

**Walter J. Diehl,** with the California division of Tide Water Associated Oil Co. since 1927, has been named credit manager in the Washington district. Diehl was assistant district manager of operations in the Philippines for Associated before the Japanese war, and he spent 39 months in the Santo Tomas internment camp.

**Glen Ruby,** vice president of United Engineering Corp., has returned to Buenos Aires after visiting New York, and he will proceed with his geological survey in the Punta Arenas (Chile) district for Corporation de Fomento de Chile.

**Lewis Finch, Jr.,** formerly district engineer at Odessa, Tex., for Stanolind Oil & Gas Co., has been transferred to Fort Worth as assistant division engineer.

**Bushrod Brush Howard** has been elected to the board of directors of Standard Oil Co. (New Jersey), following the retirement of **Wallace E. Pratt.** He has been general manager of Jersey's marine group throughout the war.

**William Morrison,** superintendent for George Livermore, Inc., has arrived in Punta Arenas (Chile) to take charge of drilling operations for Corporacion de Fomento. Most of the American crews have also arrived in Punta Arenas. The first wells will be drilled on the Isla Grande of Tierra del Fuego.

**Clay Beamer,** formerly in charge of alcohol plants in the chemical products division of the Louisiana division, Standard Oil Co. of New Jersey, has been named to head a group which is studying refinery operating costs. **Dr. J. E. Wood,** who

*Again*
AVAILABLE

HYDRAULIC PUMP

The Vicker's Hydraulic Pump that so successfully produced problem wells in the past, is now again at the service of the oil industry. Rather than make a pump from inferior materials, manufacture of the Hydraulic Pump was discontinued shortly after Pearl Harbor due to the shortage of critical alloy steels from which it had been made.

If sand or other production problems bother your pumping wells, contact HOMCO—exclusive mid-continent distributor for the Hydraulic Pump.

Also available again to discuss your pumping problems is HOMCO'S "Cat" Watson—whose many years of service to the production man brought him a vast experience and a great many friends in all producing areas.

*RIGHT:* Photograph of Hydraulic Pump model with cut-away sections showing hold-down, valves, by-pass arrangement, pump rod and releasing device.

*for PRODUCTION EQUIPMENT consult:*

HOMCO

**Houston Oil Field Material Co., Inc.**
**HOUSTON, TEXAS**


was Beamer's assistant, succeeds him as director of alcohol plants. **Carl Morrison,** formerly cracking and perbuna-N foreman, has been advanced to superintendent of cracking, perbuna-N, and alcohol plants.

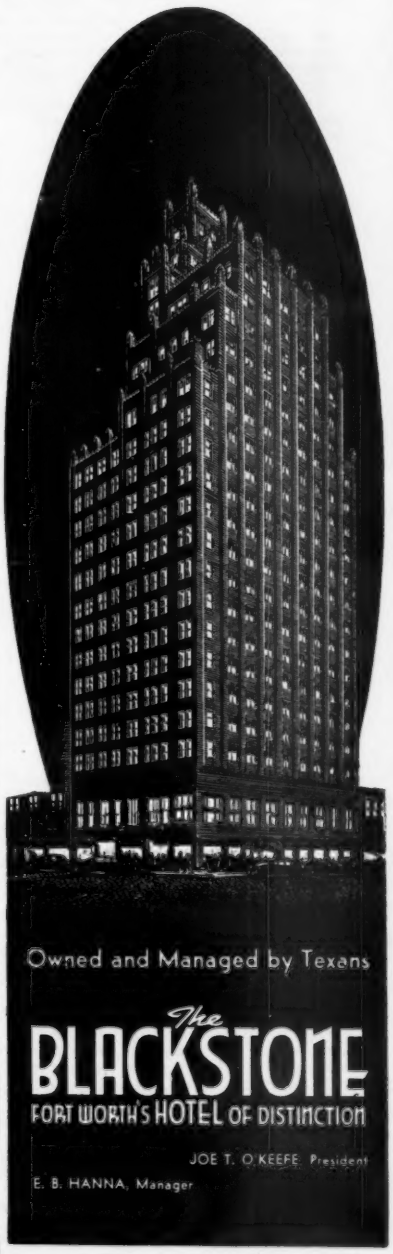
**John J. O'Keeffe,** who resigned from Richfield Oil Co. after serving 10 years as petroleum engineer in Los Angeles Basin, San Joaquin Valley, and the Coastal district, has opened consulting offices in Los Angeles.

**Bonneau Peters,** division chief scout for the southern division of The Carter Oil Co., has been elected chairman of the recreation department of Shreveport. He is a member of the board of trustees of Centenary College and is president of Shreveport-Texas League Baseball Corp.

**LEGAL**

U. S. DEPARTMENT OF THE INTERIOR, General Land Office, Washington 25, D. C. Notice is hereby given that sealed bids will be received until, and opened at noon on Tuesday, September 11, 1945, for land described herein situated within the known geologic structure of the Kevin-Sunburst oil and gas field, Montana. This land is offered to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the land under section 17 of the leasing act as amended by the Act of August 21, 1935 (49 Stat. 674, 30 U.S.C. sec. 226) in the following parcels: Parcel No. 1, T. 34 N., R 2 W., sec. 3, lot 4, SW¼NW¼, NW¼SW¼, 120.12 acres. Parcel No. 2, T. 34 N., R. 2 W., sec. 4, lots 3, 4, SE¼NW¼, 120.17 acres. Parcel No. 3, T. 34 N., R. 2 W., sec. 6, lots 1, 2, S½NE¼, 159.76 acres. Parcel No. 4, T. 34 N., R. 2 W., sec. 6, lots 3, 4, 5 SE¼NW¼, 151.41 acres. Parcel No. 5, T. 34 N., R. 2 W., sec. 6, NE¼SW¼, lots 6, 7, 111.91 acres. Parcel No. 6, T. 34 N., R. 2 W., sec. 6, SE¼, 160 acres. Parcel No. 7, T. 34 N., R. 2 W., sec. 12, NW¼NW¼, SE¼NW¼, 80 acres. Parcel No. 8, T. 35 N., R. 2 W., sec. 33, N½SE¼, NE¼SW¼, 120 acres. Parcel No. 9, T. 35 N., R. 2 W., sec. 33, W½SW¼, 80 acres. Parcel No. 10, T. 35 N., R. 3 W., sec. 26, SE¼SE¼, 40 acres. Total 1143.37 acres. Bids must be submitted on each parcel separately, but if two or more parcels are awarded to the same bidder they may be included in a single lease, provided the acreage does not exceed 640 acres. Each bidder must submit with the bid one-fifth of the amount bid in cash, or by certified check made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease, required by section 7, or Circular 1386 (43 CFR 192.19). The envelopes should be plainly marked "Bid for Parcel No. ——, Kevin-Sunburst oil and gas field. Not to be opened before noon Tuesday, September 11, 1945." No bids received after the hour fixed herein for the opening of bids will be considered. The remainder of the bonus and the annual rental at the rate of $1 per acre must be paid and a $5,000 corporate surety bond must be furnished by a successful bidder prior to the issuance of a lease. The deposits of the other bidders will be returned upon acceptance of the successful bids by the Secretary of the Interior. The successful bidder will be required to agree not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and to require an identical provision to be included in all subcontracts. Bidders are warned against violation of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Fred W. Johnson, Commissioner.


*Enjoy the Southwest at its Best-*



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W. A. DUNHAM

CARL MOULDEN

# Equipment Men in News

Phelps Dodge Copper Products Corp. has appointed **Harold Q. Noack** to serve as Pacific Coast manager, directing the sales of copper wire, tubing, cable and other products. His territory will include Washington, Oregon, Idaho, California, Nevada, Arizona, Oklahoma, Texas, New Mexico, Utah, and the Hawaiian Islands, with headquarters at the company's Los Angeles plant.

**William A. Dunham,** back in civilian life after nearly 5 years in the Army, will represent Falcon Products, Inc., in the San Joaquin Valley territory, according to an announcement by **H. F. Schlittler,** general manager of the company.

Sperry-Sun Well Surveying Co. of Philadelphia, Pa., but with sales and service offices in Houston, Corpus Christi, Marshall, Odessa, Tex.; Lafayette, La.; Long Beach, Bakersfield, Calif.; Oklahoma City, Okla., and Casper, Wyo., have just announced the appointment of Moulden Oilfield Services as exclusive representatives in the Rocky Mountain territory. This covers the states of North Dakota, South Dakota, Montana, Wyoming, Utah, and Colorado, and the northwestern part of New Mexico. Headquarters of the Moulden Oilfield Services is 329 South McKinley Street, Casper. The Moulden organization is headed by **Carl Moulden,** formerly associated with Manning & Brown.

Diesel Equipment Co., 308 South Second Street, Memphis, Tenn., has been appointed distributor for Briggs Clarifier Co. of Washington, D. C., and Bethesda, Md. The territory assigned includes western Tennessee and northeastern Arkansas and portions of southeastern Missouri, southern Illinois, southern Indiana and southern Kentucky. **Worthington Brown** and **William F. Fay** jointly own and manage the firm.

Shaffer Tool Works has built a new shop on the company's property at 1925 West Second Street, Odessa, Tex. This is a branch of the main plant at Brea, Calif., and will be operated from the Houston, Tex., branch, where **Carl W. Vogt** is district sales manager and in charge of all Mid-Continent and Texas operations. The new Odessa branch will be in charge of **James Roe. James Edgar Jackson** is fishing-tool operator and service man and **Clarence A. Kennedy** is shop mechanic.

**L. C. Bendit,** manager of the oil-field division of Construction Machinery Co., Waterloo, Iowa, announces new quarters at 1506 Esperson Building, Houston, Tex.

Peerless Pump Division of Food Machinery Corp. has rearranged territorial distribution by the establishment of five sales districts. **Warner G. Vaughan** has been appointed Atlantic district sales manager, with offices in Suburban Square, Ardmore, Pa. The southeastern territory has been placed under the management of **Charles E. Tierney** with offices in the Blair Building, 215 Church Street, Decatur, Ga. **Edward W. Pierce** will continue in charge of the central territory and as district sales manager is making his headquarters at the Peerless Canton, Ohio, works. The southwestern territory has for its district sales manager **William E. Griffin** and headquarters are at 122 East Fifth Street, Plainview, Tex. **B. A. Tucker** is Pacific district sales manager, with headquarters at 301 West Avenue 26, Los Angeles, Calif.

A new department devoted exclusively to refinery equipment, under the direction of experts in the refinery field, is announced by The Cooper Alloy Foundry Co. This department will specialize in heat-resisting stainless castings suitable for the newer chemical processes and practices now being so widely adopted in modern refinery practice.

Ansul Chemical Co., Marinette, Wis., are building a new structure for the company's Dugas division. The building will house manufacturing operations for Dugas fire extinguishers and is expected to be completed this fall.

**Col. W. F. Rockwell,** president of Pittsburgh Equitable Meter Co., Pittsburgh, Pa., has announced the formation of the Pittsburgh International Corp., with offices at 7701 Empire State Building, New York City. This firm will handle the export sale and distribution of products manufactured by Pittsburgh Equitable Meter Co.-Merco Nordstrom Valve Co., and subsidiaries. The Pittsburgh International Corp. will be under the direction of **A. L. DiGiulian,** vice president.

Houston Oil Field Material Co., Inc., is again selling and servicing the Vickers' hydraulic pump. Manufacture of this pump was discontinued shortly after Pearl Harbor due to the shortage of critical materials. The high-alloy steel used in its manufacture is now available and large pump stocks are now maintained in Homco stores, the sole Mid-Continent distributors for the pump. **J. A. "Cat" Watson** is again back in the field. The hydraulic pump is of the displacement type, embodying a bypass arrangement that tends to prevent sand cutting, as well as sanding up of the working mechanism.

Penn Electric Switch Co., Goshen, Ind., announces the appointment of three new branch managers and the opening of a new branch office in Milwaukee, Wis. **E. M. Smith,** formerly manager of the company's Detroit office, has been transferred to the home office as manager of the Goshen factory sales branch covering northern Indiana, part of western Ohio and southwestern Michigan. **G. Orr Sanders** has been employed to succeed Smith as manager of Penn's Detroit office. **E. S. Kyle** has been engaged to manage the new branch office at 1141 North Van Buren Street, Milwaukee.

General Paint Co., Hill, Hubbell & Co. division, announces an additional new home in Girard, Ohio. The new plant has 60,000 sq. ft. of processing factory space under one roof.

**Clarence Leslie Williams** has joined the staff of sales engineers of The Foxboro Co., Foxboro, Mass., whose headquarters are in the company's New York office, 420 Lexington Avenue. He has been assigned to the northern New Jersey territory.

**R. H. Luscombe,** sales manager, Penn Electric Switch Co., Goshen, Ind., has announced the addition of **Lester D. Linehan** as sales engineer for the company's Chicago office at 520 North Michigan Avenue. Linehan will work with **E. B. Maire,** manager of Penn's Chicago branch.

Chiksan Co., manufacturers of Chiksan ball-bearing swivels, Brea, Calif., announces the appointment of Well Equipment Manufacturing Corp., Houston, Tex., as exclusive Chiksan representatives for Texas, Oklahoma, Kansas, and portions of Mississippi, Arkansas, and New Mexico.

Construction of a new $100,000 box plant and log saw mill by the Sullivan Box Factory, on an 11-acre site, were scheduled to start immediately. The new log saw mill will be completely electrically operated, power being generated by a 200-hp. diesel engine. The saw mill will have cutting capacity of 20,000 board feet daily, or approximately one car load.

The following firms were awarded the Army-Navy "E," or additional stars in previously won burgees, in the closing days of the war: Flexitallic Gasket Co., Camden, N. J.; Templeton, Kenly & Co., Chicago, Ill.; Federal Telephone & Radio Corp., Newark, N. J.; The Dayton Rubber Manufacturing Co., Dayton, Ohio; Mine Safety Appliances Co., Pittsburgh, Pa.; American Meter Co., Philadelphia, Pa., second award; Bowser, Inc., Fort Wayne, Ind., fourth renewal; Youngstown Sheet & Tube Co., Chicago district plants, third renewal.

**Richard P. Dodds,** formerly a lieutenant colonel in the transportation corps, and previously manager of sales, promotion and advertising of Truscon Steel Co., Youngstown, Ohio, subsidiary of Republic Steel Corp., has rejoined the company as manager of the dealer-commodity department. **Paul L. Callahan,** formerly assistant to Dodds, has been appointed manager of Truscon's advertising department, and **Ralph H. Sarlor,** formerly a colonel in the transportation corps, has resumed his duties as sales manager, window and door division.

**W. L. O'Brien** has been promoted to manager of the stainless steel division of Jessop Steel Co., Washington, Pa.

Acquisition of B. F. Sturtevant Co., of Boston, Mass., has been announced by **A. W. Robertson,** chairman of Westinghouse Electric Corp. The Sturdevant company becomes a wholly owned Westinghouse subsidiary, operating as B. F. Sturtevant Co., a division of Westinghouse Electric.

All Mid-Continent sales and service of engines, control equipment, separators and tanks will henceforth be handled by Climax Industries, Inc., factory-owned distributor of Climax Engineering Co. of Clinton, Iowa, and McAlear Manufacturing Co. of Tulsa and Chicago (formerly Hanlon-Waters and McAlear). **Allen George** will have charge of all drilling and oil-well pumping-engine sales. He will make his headquarters at Fort Worth, Tex. **Jimmy Dvoracek** has been appointed sales manager of the control division and will supervise and direct all sales of control equipment, separators and tanks. He will retain his headquarters at Houston, Tex., and branch offices will be maintained at Corpus Christi, Wichita Falls, Odessa, Fort Worth, Tex.; Houma, La., and Tulsa, Okla.